Chemical Week

June 4, 1955 Price 50 cents



Pleasant outlook for management: more potential executives in training . . . . . p. 24

Polyethylene update: Surfeit plus new varieties spark applications probe . . . . . p. 58

First is it first: that's the slick trick in sinking a mine shaft on a [illegible] site . . . . . p. 70

Ethanolamine output doubles in four years, accents a tri-split market . . . . . p. 89

Herbicides at seeding time—pre-emergence uses now take a tenth of weed killer output . . . . . p. 87

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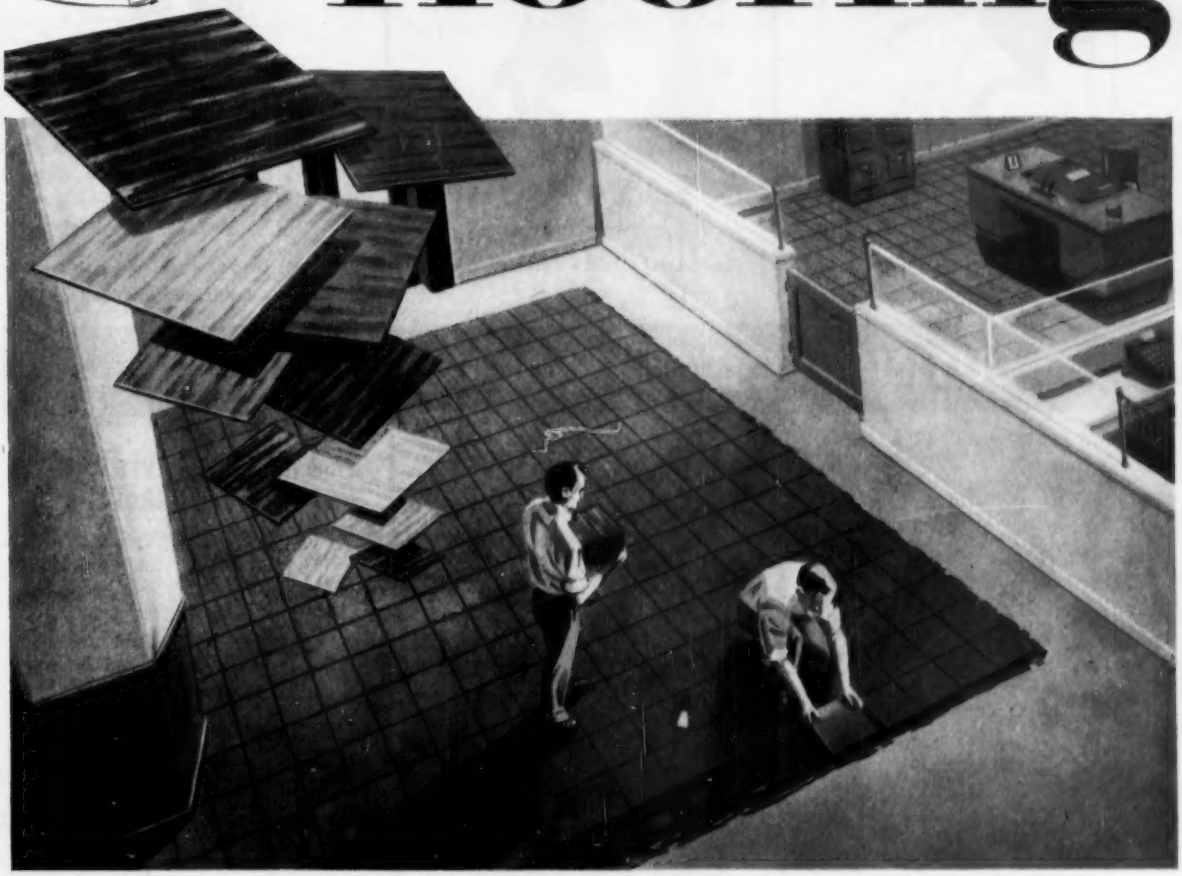
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4 OPINION
13 NEWSLETTER
17 BUSINESS & INDUSTRY
Salk vaccine scramble for protection starts as manufacturers line up together
18 New index on capital expenditures highlights chemical industry's growth rate
19 Industry spokesmen protest, tell Congress customs simplification would slash chemical tariffs
24 In prospect: more potential executives per class of engineers-in-training
28 Executive air travel increases; the trend's toward owning your own plane
32 It's all over but the shouting, as foreign trade bill nears passage
37 New Houston company is formed to take over government-purchased butadiene units
44 TARGET:
Photosensitive polyvinyls to produce images by heating
46 DISTRIBUTION
Polyethylene manufacturers map plans to sell soaring output
50 Vitamin maker tests promotion before sales campaign
58 RESEARCH
Du Pont joins high-density polyethylene roster
64 High safety, low discomfort mark new steroid anesthetic
70 PRODUCTION
Morton Salt uses slick freezing trick to sink shaft for salt mine
74 Babcock & Wilcox concentrates on steam generation studies
85 MARKETS
Market Letter
89 Ethanolamine outlets shift as U.S. output races toward 80-million-lb. mark by '56
90 Wisconsin roads use sulfite
97 SPECIALTIES
No place to grow: weeds foiled by pre-emergence herbicides
100 Household insecticide consumption's on the rise, CSMA shows

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OPINION . . . . . .

Motor City View

TO THE EDITOR: . . . I don't suppose that even your magazine, which has often been berated for searing some "sacred cows," would publish the vitriolic remarks of the Detroit Board of Commerce concerning the chemical industry. But here is a clipping . . . from the May 9 issue of the *Detroiter*, which is published by that organization . . .

JOHAM J. EGERT
Ann Arbor, Mich.

Our opinion columns are a forum—and are wide open for all opinions, be they those with which we agree or not. Said the Detroiter:

"The U.S. Tariff Commission is investigating injury to domestic producers of ferrocerium and other cerium alloys, a material used in lighter flints. The 1954 injury claimed by the Kent Metal and Chemical Co. and New Process Metals, Inc., totaled $21,571—the total value of the imports. If one uses the Dept. of Labor estimates for industry generally, that approximately $5,000 of imports are required to displace one U.S. worker, the imports in this case would appear to have affected the jobs of four or five workers.

Occasionally, your Board of Commerce crosses swords with friends in the chemical industry on U.S. foreign trade policy, specifically on the tariff issue. In 1954, gross sales of the U.S. chemical industry were $20 billion—including exports of $1 billion or 5% of total sales; imports were substantially less than exports—$245 million of chemical products, half of which were the nonfertilizer variety and represented only 1¼% of the U.S. industry's gross sales.

During 1954, chemical exports increased 25% over 1953, imports decreased 13% over 1953. And all without a change in the tariff. What is the threat?

Your board has never been able to understand the basis for fears that chemical imports are now, or will in the near future, flood the U.S. market."

Sordid Whirl

TO THE EDITOR: . . . I have been impressed by several of the news stories you have published on the Salk vaccine affair and, in particular, by the report in your May 21 issue "Going, Going, Gone: Doubts on Vaccine." I would not suggest that you are not accurate in what you say about the program and the developments in Washington, simply because I notice that, in the main, you have quoted the statements of officials. Nonetheless, in my opinion, some of these officials have been far from straightforward in their observations; too, I believe that they have often indulged in opinions that may well stem from an inadequate pool of knowledge.

It is possible, I suppose, that the program might have been handled in a worse fashion if someone had set out deliberately to do so; but it would have taken a great deal of imagination and ingenuity for anyone to really succeed in "out-worsening" what has been done. There has been, to my mind, a gross display of negligence, ineptitude and lack of foresight. It has caused many parents anguish; it may have cost lives; too, it has hurt the pharmaceutical industry.

There have been many sweet phrases coming out of Washington that stress that the government is now going to check and recheck all vaccine because of its interest in the public safety. Oddly enough, at the same time that vaccinations are proceeding, the rechecking is going on. But has anyone admitted that adequate testing was not done previously? Has anyone explained why not? Has anyone done anything except pass the blame on to someone else by ducking and dodging his responsibilities?

The basis of the whole fiasco, as I see it, is the unbridled lust for publicity that the Polio Foundation had. I cannot see why, for instance, the Francis Report was released on the birthday of the late President Roosevelt unless it was to heighten the dramatic effect and to get a lot of publicity. Too, there were almost as many newspaper "leaks" prior to the actual release of the report as there were in the case of the Kinsey Report.

Perhaps all this satisfied the egos of the people concerned (and, by the way, I am sure that Dr. Salk was not one of them. He is a sober scientist who just happened to be caught up in the sordid whirl of the Barnum and Bailey operation). But by stirring up all the publicity the promoters did arouse public expectations—so that pressure was put on the government to start delivering the vaccine right away. As one drug man has said, "We were handed an incomplete product and had to get it into production right away." No one seems to have paid much attention to the possibility that neither testing nor production procedures were necessarily perfected; indeed, there is much evidence to indicate that neither was.

In any event, as a direct result of what was done to excite everyone about the vaccine, we now have this situation: a large number of children will not be vaccinated, and many parents will be anguished.

If the vaccine is efficacious, a great many people have been deprived of protection they might have had; if it is not efficacious, many children may have been needlessly treated and perhaps harm has been done to them. All this stems from a lurid publicity affair. Those responsible have a tremendous guilt to bear.

I don't think that much can be done about it now. However, I would have more respect for some of the government authorities if they did admit that they, too, had not discharged their responsibilities with calm objectivity. They seek the respect of citizens—they continued the original program with that mainly in mind; perhaps they will learn that respect is earned only by the forthright. Perhaps, too, they will head off any such fiasco in the future by being both foresighted and factual . . .

L. T. HOWDON,
Chattanooga, Tenn.

Wool Dream

TO THE EDITOR: Your news article, "Ammunition for Wool" (*May 14, p. 56*), mentions the wool industry dream "of a simple chemical treatment to imbue wool fiber with per-

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Address all correspondence to: W. A. Jordan, Chemical Week, 330 W. 42nd St., New York 36, N. Y.

manent resistance to moths, fungi, bacteria and alkalis." It's no longer a dream.

The enclosed two samples of wool fibers have been processed by a simple, inexpensive, fast method with chemicals that are readily available. Treated fiber and fabrics can be dyed as usual . . .

CLARENCE KLUG
Klug Engineering Service
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Sales Booster

TO THE EDITOR: You mentioned in your Distribution Dept. (*April 30, p. 84*) that Commander Whitehead of Schweppes (U.S.A.) Ltd., met with a group of chemical salesmen and "gave them something to think about" re product promotion methods . . . You omitted to say, however, that the group was the Chemical Industry Assn., formerly called the Chemical Engineers of Greater New York.

This, by the way, was one of the best meetings we ever had . . .

SHEPHERD STIGMAN
Director of Public Relations
Chemical Industry Assn.
New York

Sorry. Our oversight.—ED.

DATES AHEAD . . .

World Petroleum Congress, Rome, Italy, June 6-15.

Manufacturing Chemists' Assn., annual outing with SOCMA, Greenbrier Hotel, White Sulphur Springs, W. Va., June 9-11.

National Plant Food Institute, Greenbrier Hotel, White Sulphur Springs, W. Va., June 12-15.

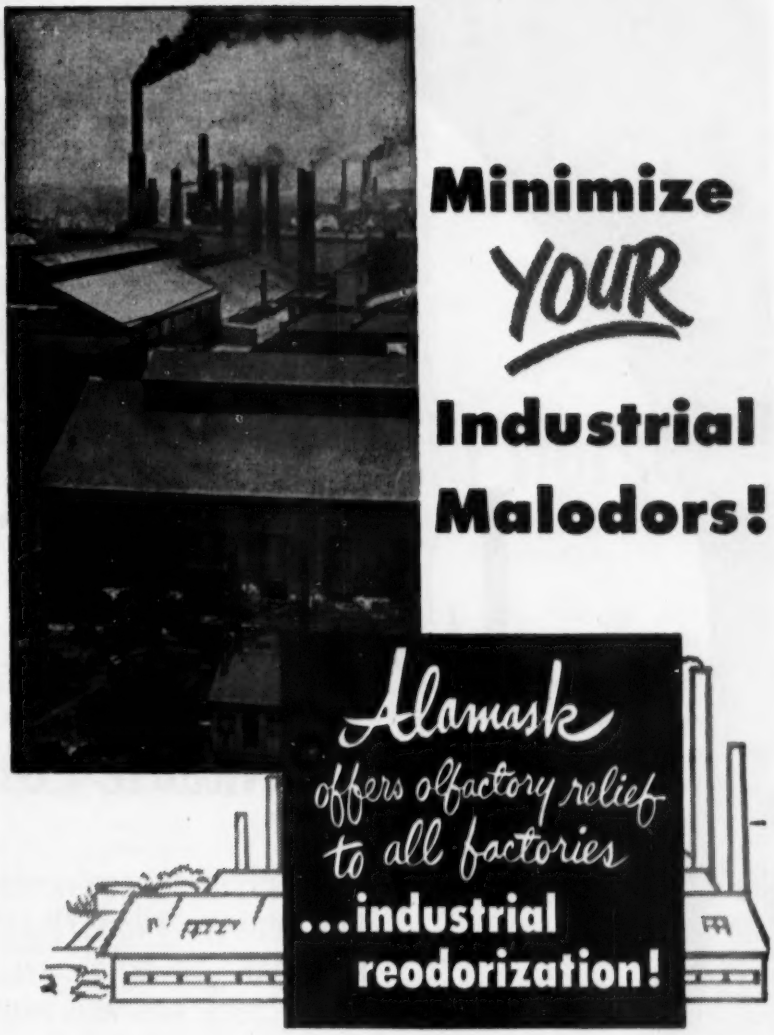
Armed Forces Chemical Assn., annual meeting, Cleveland Hotel, Cleveland, June 16-17.

Forest Products Research Society, national meeting, Olympic Hotel, Seattle, June 20-23.

American Society for Testing Materials, annual meeting, Chalfonte-Haddon Hall, Atlantic City, N.J., June 26-July 1.

Society of the Chemical Industry, annual meeting, University of Birmingham, Birmingham, England, July 11-16.

American Soybean Assn., Natl. Soybean Processors Assn., joint meeting, Netherlands Plaza Hotel, Cincinnati, Aug. 29-31.



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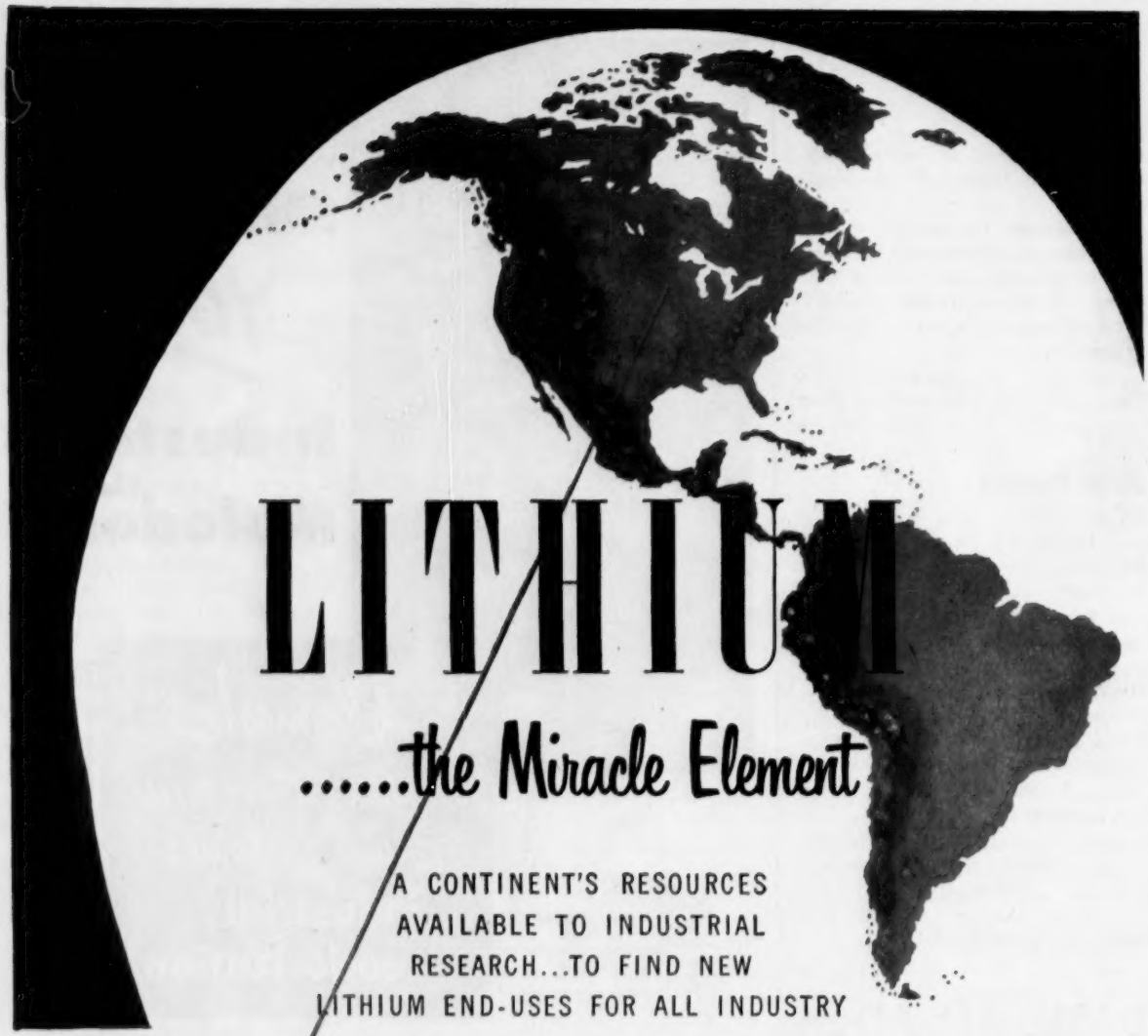
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TO AMERICAN BUSINESS...

Thanks for Taming a Wild Horse

This is a message of appreciation to American industry. The occasion for the message is the completion of our eighth annual McGraw-Hill Survey of Business' Plans for New Plants and Equipment.

To a considerable degree, our appreciation is personal. It goes to the companies whose cooperation made our survey possible. Twice as many companies as in any previous McGraw-Hill annual survey carefully answered our questions about their plans to invest in new producing facilities. They gave a great deal of expensive time to the job. The cooperation of these companies, which employ nearly eight million workers, put the results of our survey on the firmest footing, in terms of coverage, it has ever had. For this cooperation we are most grateful.

But our appreciation is much more than personal. It extends in even greater degree to the kind of planning of investment in new plants and equipment which our survey revealed. The nature of this planning holds out promise that American industry is on the way toward bringing under control what historically has been one of the most upsetting forces in the American economy—the violent fluctuations in business capital investment. Progress in ironing out these fluctuations gives occasion for public gratitude.

Very Good Business News

The part of our surveys that attracts the widest interest is the news they give about immediate business prospects. And this year the news is very good. The survey results indicate that American business as a whole plans to invest $29.5 billion in new plants and equipment this year. That is 5% more than was invested last year, and a new high for any year.

Plans for the years 1956-1958 are also remarkably encouraging in terms of the amount of investment in prospect. American business reports that it is already planning to spend within 3% as much for new plants and equipment in 1956 as in 1955. In the past, the expenditures planned for future years have always been sharply lower than those planned for the current year. This is understandable enough. It is sometimes impossible to anticipate all the expenditures that will be necessary a year or more hence. Thus the fact that plans are already made

A full report of the results of the eighth annual McGraw-Hill Survey of Business' Plans for New Plants and Equipment will be sent to anyone requesting it from the Department of Economics, McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York 36, N. Y.

to spend almost as much in 1956 as this year is very good news about business prospects. The level of investment now planned for the years 1957 and 1958 is also remarkably high—far higher than ever reported for years that far ahead in previous McGraw-Hill surveys.

Taking the Long View

The fact that these plans exist is of immense constructive significance. It clearly indicates that more and more, and now in dramatic degree, American business is taking the long view in making its plans for capital investment. It is developing a program which, if successfully carried out, will go far toward eliminating the habitual, destructive surging and sagging of what is in effect the central power house of our economic system—capital investment by business. Upon the level of this investment depends not only the general state of our prosperity but our progress in raising the American standard of living with new products and new and better industrial processes.

Seven years ago, when we first asked industry to estimate its capital spending beyond the current year, only a small minority of companies could give us any estimates at all. This year, 87% of the cooperating companies—and it was a far larger number of companies—could comply with our request for estimates for the years 1956-1958.

It Pays to Bet on Growth

A number of developments help explain the increase in long-range planning of capital investment. One is the increasing technical complexity of American industry. It often takes longer, in this complicated age, to work out a successful installation of new plants and equipment. Another reason for long-range planning is American business management's increasing conviction that it pays to bet on the demonstrated capacity of the American economy to grow over the long pull. With this goes a corresponding determination not to let short-term business fluctuations upset individual company plans for growth through addition of new plants and equipment. An additional factor, and one of great and increasing importance, is the sense of public responsibility on the part of American business leaders who want to help prevent destructive swings in the levels of new investment.

It cannot be too strongly emphasized that there is still nothing automatic about the carrying out of these long-range plans for business spending. Actual expenditures are still governed in major degree by the general health of our economy. This is fully attested by the fact that the current business recovery has led to a substantial upward revision of the investment plans reported to us last fall when we made a preliminary check of plans for 1955. Either private economic excesses or a reversal of the recent improvements in federal tax policy could gravely upset realization of present plans. Fortunately, neither of these possibilities seems to be an immediate threat.

The very fact, however, that American business management has made these plans and will do its utmost to carry them out is a development of tremendous constructive importance for the American economy. It means that major efforts are being made to tame what historically has been an economic wild horse—the process of capital investment by business. Both for doing it, and for telling us about it in our annual surveys, we extend to American industry our sincere thanks.

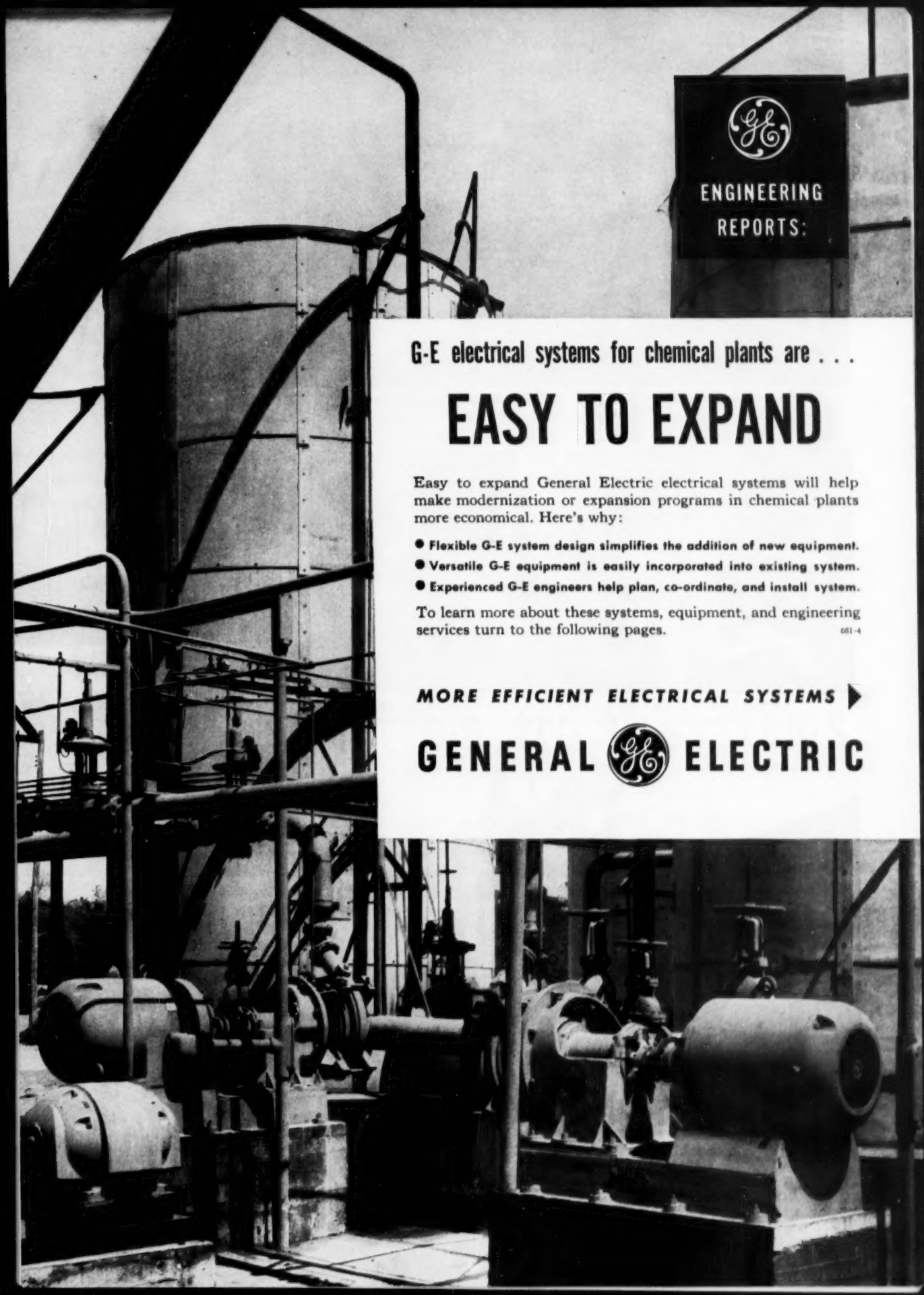
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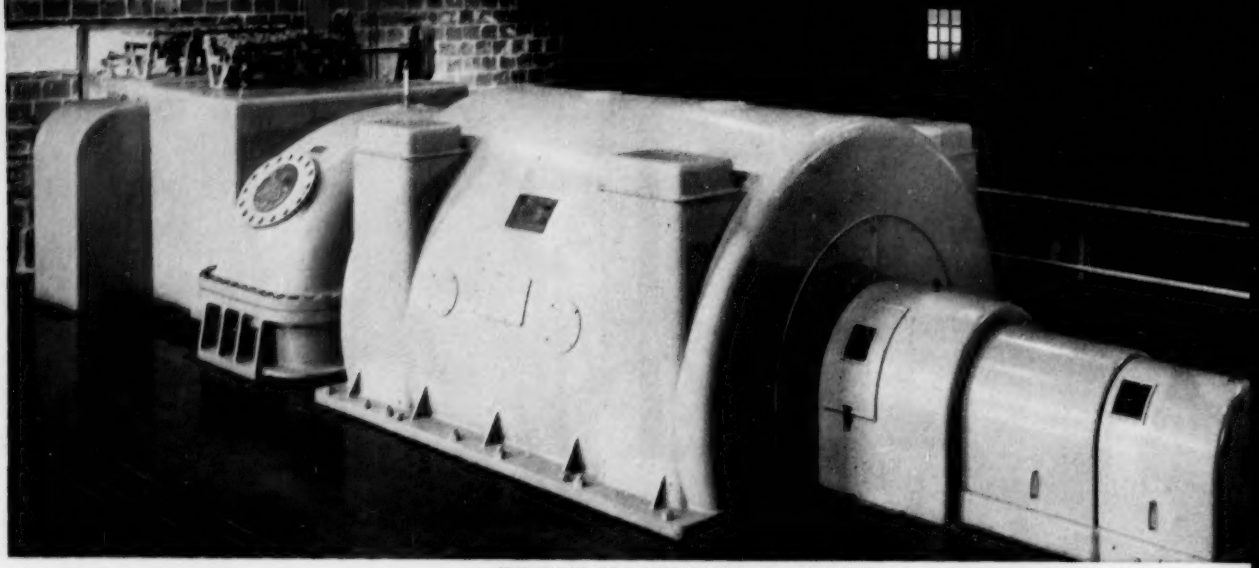
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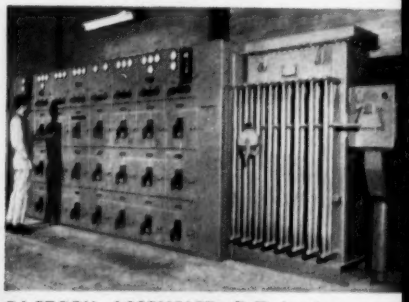
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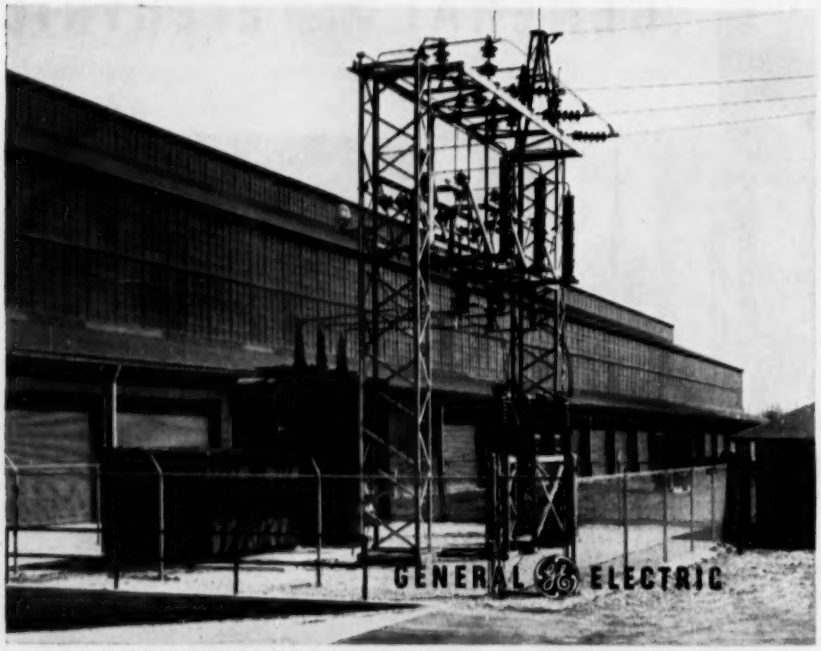
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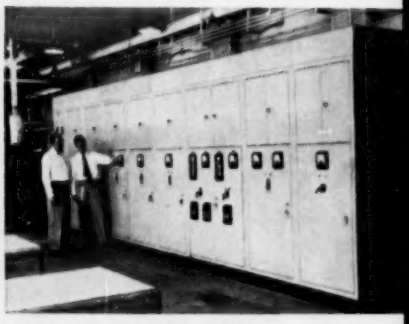
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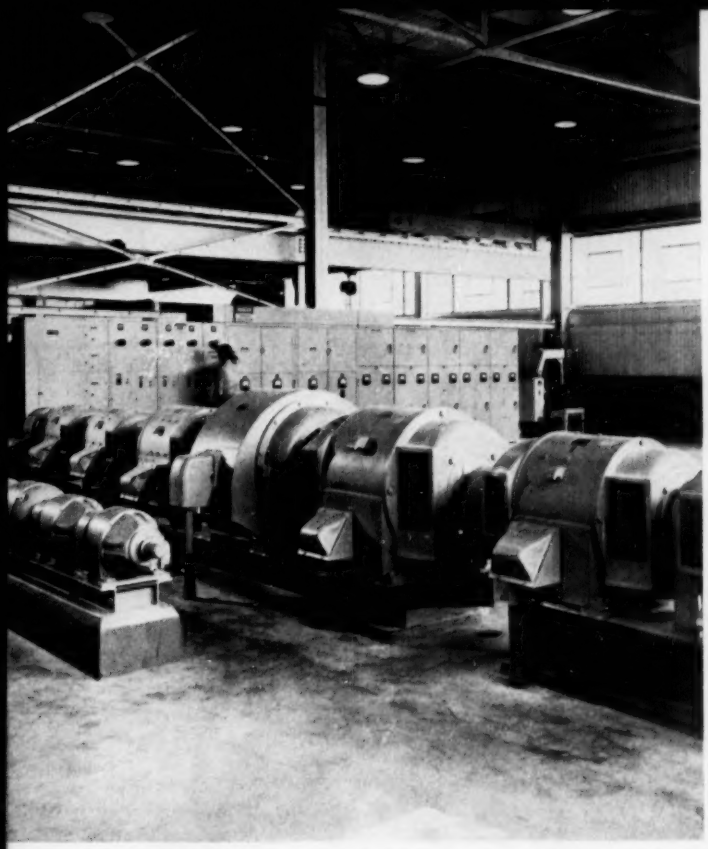
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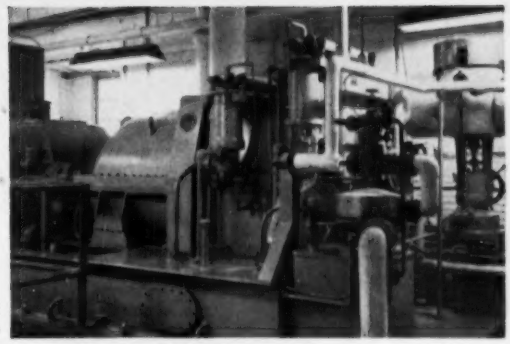
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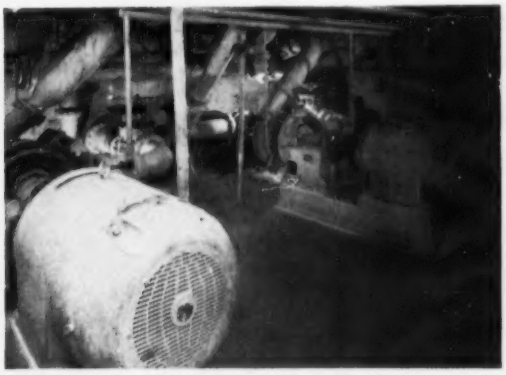
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Chemical Week
BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

NEWSLETTER

If any perennial pessimist still has doubts as to the future of the chemical industry, he has only to look at one typical company, Dow Chemical. This week Dow executives admit that the company has 97 pilot plants in operation—44 working with brand-new chemicals, 18 piloting chemicals new to Dow, and 35 testing improvements in present processes and products.

•

Equally bullish is word from Ideal Cement Co. (Denver). Convinced that construction activity (and use of cement) will continue to grow at a substantial rate for the next decade, Ideal will launch a $55-million expansion program, lifting annual capacity from 21.5 million bbls. to 31 million bbls. Four new plants will be built adjacent to present production units at Houston (cost: $8 million), Ada, Okla. ($6.5 million), Trident, Mont. ($6 million), and Superior, Neb. ($5 million).

In addition, Ideal plans to increase capacity at Redwood City, Calif. (cost: $6 million), at Mobile, Ala. ($5.5 million), Boettcher, Colo. ($4.5 million), Baton Rouge, La. ($3.5 million), Okay, Ark. ($3.5 million), and New Orleans ($1.3 million).

•

When and if its latest bid for the government-owned alumina processing plant at Laramie, Wyo., is accepted, Ideal will turn more facilities to produce lightweight aggregate for cement production, too. Annoyed with the delays it has encountered (and impatient with what it terms "GSA's fluctuations"), Ideal officials are now offering three alternate proposals to buy the Laramie facilities: $1,373 million in cash, $1.25 million on credit or minimum terms (whichever would suit GSA better), or a payment of $10,000 above any bid made by Monolith Portland Midwest Co.—up to $1.55 million. Outlook: odds are that Ideal will have its bid accepted this time.

•

More on the oft-reported ammonia plant Thunderbird Corp. is planning to build in Arizona. Construction will start immediately, according to Fred Shanaman, president. Financing is being arranged through Northwestern Mutual Life Insurance Co. Site is Kyrene, Ariz., only 12½ miles from Salt River Power District's 200,000-kw. plant.

Cost of the project (scheduled to turn out ammonia, urea and several other products): $13 million; estimated completion date: June '56.

•

American Latex Corp. admits it has patented a product called polyrubber, which among other things might have a real impact on the molding business. No expensive molding equipment will be required, American Latex spokesmen claim; just pour the liquid into the mold, and the finished product is ready for use.

•

Probing of proxy voting, second phase of the Senate stock market investigations, got under way this week on Capitol Hill. First witnesses discussed in detail the recent battle between Sewell Avery and Louis Wolfson for control of Montgomery Ward.

It's a good bet that, armed with this testimony alone, the Demo-

cratic majority of the Fulbright Senate Banking Committee will recommend closer supervision of such proxy voting by the Securities & Exchange Commission.

•

Also of a crackdown nature: Senator Murray's (D., Mont.) recommendation to a House Small Business Committee that the Justice Dept. be encouraged to broaden its antitrust action against Alcoa.

Among other suggestions: Murray would broaden the current charges against Alcoa to include Reynolds Metals Co. and Kaiser Aluminum & Chemical Corp., and would launch a federal suit to divest all three firms of their aluminum fabricating facilities.

•

Reynolds Metals may also be fighting on another front soon. Its adversary: the Alabama State Legislature, which is considering a corporation tax on all manufacturing facilities in the state of Alabama.

If and when such legislation is passed, Reynolds Metals' president, Richard Reynolds, warns his firm will be forced to reconsider its plans to build additional aluminum-producing units at Sheffield. The company already has plants operating in the state turning out 100 million lbs./year of aluminum.

•

Alberta last week made an equally determined stand. Province officials claim it won't permit any other government in Canada to say anything through a water pollution control board that might affect the booming petrochemical industry centered around Edmonton.

Persistent attempts have been made by Saskatchewan and Manitoba (bordering provinces) to persuade Alberta to join an interprovincial pollution board endowed with wide powers. But Alberta remains firm, will deal with pollution problems on its own.

•

Financier Floyd Odlum is reported to be considering building two uranium processing mills in Utah using nuclear power. Preliminary plans have already been discussed with the Atomic Energy Commission; Odlum has made tentative bids for plant sites in both Green River and Moab.

Construction will start, Odlum says, in four to six months after AEC authorization is granted.

•

What is being described locally as the "biggest rush in five years" is carrying scores of prospectors into the Maskwa-Bernic Lake area of northern Manitoba, Canada. The objective: lithium.

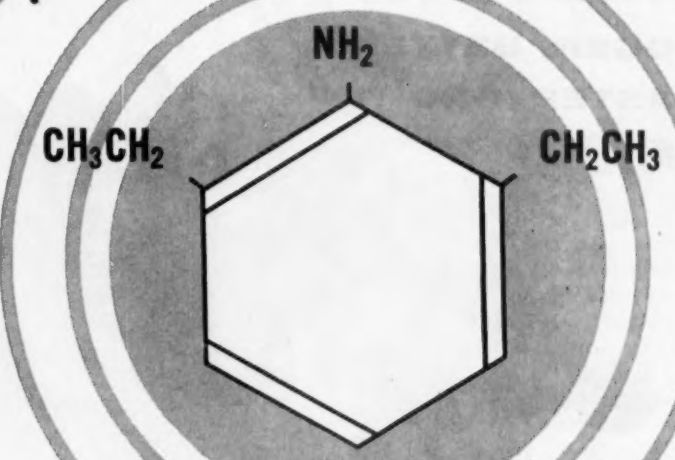
Over 600 claims were staked in May alone; Central Northern Airlines is sending eight to ten flight loads of prospectors into the region daily. What started off the rush: Viola Mac Mines' statement that it will spend $75,000 over the next few months for diamond drilling at Cat Lake.

•

Formed primarily to liquidate remaining assets of the old empire, I.G. Farben again this week has its own board of directors. And though relatively few Americans hold liquidation certificates (so-called "blanket claims" on all remaining assets), the board's actions will be closely watched from this side of the Atlantic.

Why? Decision as to what assets must be written off as a loss will have heavy political overtones. Over 60% of former I.G. property still rests in the Soviet Zone of East Germany, and recently the Russians have been again hinting at possible reunification.

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BUSINESS & INDUSTRY. . . .



WIDE WORLD

SCHEELE, SALK: Aiming for safe manufacturing processes through . . .

Permanent Vaccine Panel

The new minimum standards for Salk polio vaccine should get the inoculation program going again—but only after considerable delay.

Why? The new standards for testing and production will go into effect gradually. On material that has been manufactured, tested and bottled, present data will be reviewed before release, though if there is any question over safety, the full new testing routine will be carried out by the maker.

This new test series will be required on all previously manufactured and tested material. The government, with the independent laboratories working for it, plans a much-broadened test program of its own.

Also the new production standards, which cover such detailed steps as the amount of agitation during inactivation of virus with formaldehyde, will be applied to all new batches, and where possible on those already in the works.

No Easy Job: Working out the new production and testing standards has not proved to be an easy job. Manufacturers take the position that they want assurances that methods are safe, but are balking at complicated new requirements.

Though their comments are being made in closed meetings with officials of the U.S. Public Health Service, manufacturers feel the current proposals are a good deal more stringent than they really need to be. "The testing they have been thinking of," complains one executive, "would stagger our facilities. We couldn't come close to meeting production rates."

Parke, Davis' executive vice-president, Homer Fritsch is milder in his comments: "Tentative specifications," he declares, "are not entirely satisfactory as presently written."

What's Been Done: To handle the safety factor, a permanent vaccine clearance panel has been established by Surgeon General Leonard Scheele. This group, headed by Dr Jonas Salk, and including six other virologists and government officials, will recommend to Scheele which batches of vaccine are safe for use. In addition, the panel will continually review the manufacturing processes used by the various drug houses. Object will be to build a greater safety factor into the vaccine.

The government still does not plan to reclear vaccine made by Cutter Laboratories, though it has nothing yet but statistical coincidence—labeled "strong presumptive evidence"—on which to blame cases of polio.

The extent of the case against Cutter was revealed last Wednesday by Dr. W. H. Sebrell, director of the National Institute of Health, in testifying before a Congressional committee. This is what he said:

"Of eight batches of Cutter vaccine used to inoculate some 400,000 children, no cases were reported among those receiving material from four batches, and only isolated cases from those receiving shots of two others. The remaining two batches are still possibly incriminated.

Pattern of Expansion

General Services Administration hopes to encourage development on more efficient titanium production after signing contracts for pilot-plant operations with two experimenting organizations—National Research Corp. and Horizons, Inc.

Horizons, Inc., alone will spend an estimated $96,500 on experimentation to recover titanium from impure scrap metal. National Research Corp., for its part (using a fused salt process), will build a $1.2-million plant with a rated daily capacity of 1,000 lbs.

The government plans to reimburse both companies for costs, but not for working fees. If the tests are successful on a commercial basis within 10 years of the contract, the companies will then repay the government for its initial investment. The government will also receive royalty-free, nonexclusive licenses on any inventions developed.



WIDE WORLD

BIAS-SPOTTER RABB: In petrochemicals, a charge of unfair practices.

Probe on Hiring

The Eisenhower Administration's program to wipe out racial discrimination in government contract work is expanding to major industries – with attention soon to be focused on the oil and chemical industries.

At four major Southwest plants, the companies and the unions are accused of discriminating against Negroes in hiring and promoting of employees. These charges—filed on behalf of certain employees at those plants by the National Assn. for the Advancement of Colored People—will shortly be reviewed by the President's Committee on Government Contracts.

This is the first time the committee has been asked to look into complaints that sweep across whole industries. While the specific charges are against four firms and four unions, the NAACP adds the assertion that such discrimination "is not confined to the companies or unions named, but is prevalent throughout the entire industry."

In Three States: NAACP says the companies and unions at the four plants in three states have conspired to discriminate against Negroes in hiring, seniority, wage scales, apprentice training, and other issues relating to job security.

Named in the complaint: Esso Standard Oil (Baton Rouge, La.) and the Independent Industries Workers Assn.; Cities Service Refining Corp., (also of Baton Rouge) and the Lake Charles Metal Trades Council (AFL) and Local 969 of the AFL Teamsters; Carbide and Carbon Chemicals Co. division of Union Carbide and Carbon (Texas City, Tex.) and Galveston Metal Trades Council (AFL) and Local 374 of the AFL Operating Engineers; and Lion Oil Co. (El Dorado, Ark.) and Local 381 of the Engineers union.

The committee—headed by Vice-president Richard Nixon, with White House counsel Maxwell Rabb as executive secretary—is being urged to devise a formula that would eliminate the allegedly discriminatory practices. If the complaint is found to be justified, the Nixon group will advise the government agencies that have contracts with those companies to conduct field investigations and seek to negotiate settlements.

It's been operating quietly, but the committee has been getting results. In its two-year history, the group—composed of government, industry and labor officials—has taken on 136 cases, mostly one plant at a time. Now it appears that the committee is about to delve into multiplant cases.

New Outlay Index

A new measurement of expansion and renovation in U.S. industry—spending on new plant and equipment per production worker—shows the makers of chemicals and allied products to be investing in production facilities at more than twice the all-manufacturing average rate.

The Commerce Dept. table (*below*) shows the ups and downs of this industry pulsebeat for the past decade, with an extrapolation of current spending as a projected figure for 1955.

This new yardstick of chemical growth and retooling was drawn up by the Business & Defense Services Administration's Chemical & Rubber Division, now headed by Herbert Bertine of Allied's General Chemical Division. It appears in the current issue of the division's monthly publication, *Chemical and Rubber Industry Report*.

Chemical Outlay High: The report notes that—except for the petroleum industry—capital outlays per production worker are probably higher in the chemical field than in any other line of manufacturing. The 1953 peak coincided with the crest of construction activity under the accelerated tax amortization program.

Reconversion from war to peace production shows in the 1945-47 period when the industry's capital input per production worker jumped by 219% during the two years.

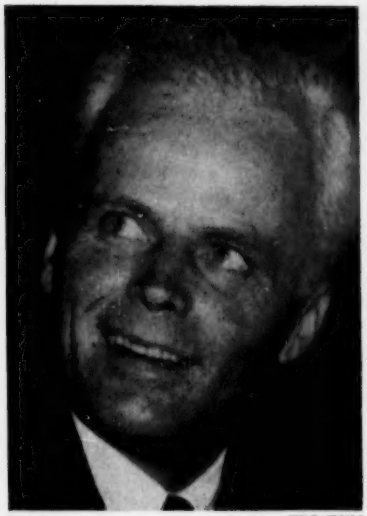
Continuing high-level capital outlays per production worker in the chemical field is presented as "a direct outgrowth of the heavy costs involved in increasing automation, as well as the constant development of new chemical productive processes requiring extensive investment."

Adds BDSA: "The cyclical and continuous nature of much chemical processing and manufacture lends itself more readily and extensively to large-scale automation than is the case in most other manufacturing industries. At the same time, it is ironical that continual development of new processes and products actually increases the rate of obsolescence for equipment installed at high cost."

Capital Input Per Capita: Higher In Chemicals

(Expenditures on new plant and equipment per production worker, 1945-55. Source: Business & Defense Services Administration, U. S. Dept. of Commerce.)

Year	Average for all manufacturing industries	Chemicals and allied products	Year	Average for all manufacturing industries	Chemicals and allied products
1945	$280	$ 633	1950	$577	$1,428
1946	553	1,481	1951	790	2,099
1947	662	2,019	1952	847	2,329
1948	694	1,699	1953	824	2,333
1949	585	1,267	1954	838	1,932
			BDSA prediction for 1955:	813	1,894



WIDE WORLD

FOR THE BILL: Duty cuts, says Rose, would be 'negligible.'



WIDE WORLD

AGAINST THE BILL: Chemical duties, says Hansen, would be slashed.

Customs in Committee: Time to Tinker

On every issue, as an old-time sage once remarked, there's a time to keep silent and a time to speak. On the customs simplification bill (H.R. 6040), last week was the chemical industry's turn to speak out; and this week, industry stands discreetly mute while members of the House Ways & Means Committee take time to discuss —and possibly revise—this much-disputed measure.

If the committee tinkers with the bill, chemical management is hoping that the clause on evaluating imports will be sharply altered before the bill goes to the floor of the House. That provision brought forth particular protests from the chemical industry spokesmen who appeared as witnesses at last week's hearing.

Hooker Electrochemical's H. R. Hooker, speaking for the Synthetic Organic Chemical Manufacturers Assn., and Allied Chemical's Richard Hansen, representing the Manufacturing Chemists' Assn., both supported the bill's asserted objective: to simplify customs procedures, cut red tape. But they assailed provisions that they said would go beyond simplification and in effect lower tariff protection for U.S. industry in general and for the chemical industry in particular.

Cuts Not Selective: Hooker and Hansen protested specifically against the provision that would change the preferred basis for evaluating imports for duty assessment to the "export value" (actual cost of a product to the exporter) from the "foreign value" (wholesale domestic price of the item in the country of origin). They also scored proposed changes in definitions of certain terms used in determining import values.

These two proposals together, Hooker told the committee, would have this effect on appraised value of organic chemical imports (excluding coal-tar products):

- For all chemicals in this category, appraised value would be reduced by amounts averaging between 4% and 10%.
- For those chemicals in this category that are subject to ad valorem or compound duties, appraised value would be reduced by between 8% and 16%.

Furthermore, the chemical industry representatives pointed out that this weakening of tariff protection for the industry would be carried out unilaterally, across the board, and without regard to consequences for makers of individual products. This, they contended, would violate the principles of selectivity, reciprocity, and gradualness of the reciprocal trade program.

Amendment Asked: Hooker urged that if H.R. 6040 is to be approved by Congress, it should first be amended to require increases in tariff rates to compensate for those reductions in appraised value of imports.

"If tariff simplification is to be accomplished," Hooker summed up, "let it be confined to simplification, and do not permit it to be used as a guise to bring about a further lowering of tariff levels."

Hansen wound up on a similar note, holding that it should be "possible and desirable to achieve simplification of customs administration without further reduction in duties." "We further believe, and strongly urge," he added, "that until the proper methods of attaining this objective can be worked out, provisions affecting duties should not be put into law."

Reductions Called Slight: Testimony in favor of the bill came from the Eisenhower Administration, with Assistant Secretary of the Treasury H. Chapman Rose insisting that the bill's actual impact on present tariff protection would be "negligible." He said lowering of tariff rates would average for all groups of ad valorem imports about one-half of 1% of the duty-paid cost to importers.

Even the limited simplification authorized last year, Rose reported, had made it possible to reduce the backlog of unliquidated customs entries by nearly one-third.

Speed-up on Patents

The snail isn't about to break into a headlong gallop, but it may speed up to an easy-going amble. That's assuming that Congress will vote to increase by several million dollars the U.S. Patent Office budget for fiscal year 1955-56, permitting a gradual speed-up on processing of patent applications.

Of concern to chemical companies and other members of the American Patent Law Assn. is the backlog of about 210,000 applications now pending. Because of that backlog, it now takes about four years to get a patent, whereas Commissioner of Patents Robert Watson would like to trim the waiting time to half that period.

The House last week allotted the Patent Office $14 million for the coming year, up $2.5 million. This increase would permit boosting the number of patent examiners from 640 to 940. It's considered almost certain that the Senate will go along with the increase, inasmuch as Appropriations Committee members and other legislators have been deluged with com-

plaints about the present slowness of getting a patent.

But new funds can't immediately erase past parsimony. About half of the new corps of examiners will be needed just to keep the application backlog from getting larger. The reinforced Patent Office will be able to handle some 90,000 applications a year; but since applications come in at the rate of about 78,000/year, the outlook as of this week is that it'll take about 11 years to eradicate the backlog. Several investigating senators feel that still more speed-up is needed.

COMPANIES . . .

Warner-Lambert Pharmaceutical Co. will register 325,000 shares of its outstanding common stock with the Securities and Exchange Commission. The shares will be sold by International Drug Products, Inc., which now owns 558,441 shares of Warner-Lambert common.

•

Freeport Sulphur Co. has acquired sulfur rights on the Lake Pelto Dome in Louisiana from the Texas Co. Preliminary drilling, Freeport officials say, has shown considerable deposits of sulfur on the mound, situated a few miles south of Freeport's Bay Ste. Elaine property, 6-8 ft. under water.

•

Geigy Chemical Corp. will transfer its main offices and laboratories from New York City to a 35-acre tract in Greenburgh, N. Y. Four main buildings will be constructed—none for manufacturing facilities. Cost: $3 million; estimated date of completion: mid-1956.

•

More company incorporations, the first in Pennsylvania, the others in Delaware:

- International Pharmaceutical Corp., listing capital stock at $100,000.
- Houston Sulphur Co., listing capital stock of $25,000.
- Brandt & Gardner Fertilizer, Inc., listing capital stock at 500 shares, no par value.
- American Exploration and Chemical Corp., listing authorized capital at $100,000.
- Electro Chemical Corp., listing capital stock at $12,500.
- Cuban International Sulphur Corp. capital stock at $4 million.

Key Chemicals Corp. has moved its main offices from Washington, D.C. to Medley (Miami Springs), Fla. Reason: Company officials feel too much time has been lost in communication between Key's main offices and its operating and production unit.

EXPANSION . . .

Carbon Bisulfide: Stauffer Chemical Co. will build a multimillion-dollar carbon bisulfide plant at LeMoyne, Ala., adjoining its present units there. Most of the output, company officials say, will be sold to Courtaulds-Alabama, Inc., now tripling output at its LeMoyne viscose rayon plant.

•

Aluminum: St. Joseph Lead Co. and Pittsburgh Consolidated Coal Co. may build an $85-million aluminum plant powered by coal. If built, the plant would give the U.S. a fifth producer of primary aluminum. Capacity: 66,000 tons/year of aluminum; site: somewhere in Pennsylvania.

Both companies have asked the Office of Defense Mobilization to let them depreciate such a plant (for tax purposes) over a five-year period.

Petrochemicals: Ground-breaking ceremonies were held last week at the site of Escambia Bay Chemical Corp.'s proposed $25-million petrochemical plant outside Pensacola, Fla.

Using natural gas as its raw material, the Santa Rosa County plant will have a rated daily capacity of 250 tons of anhydrous ammonia, 220 tons of nitric acid, 275-300 tons of ammonium nitrate and 200 tons of ammonium nitrate-ammonia fertilizer solutions. Completion of construction is scheduled for Jan. '56.

•

Aniline: National Aniline Division, Allied Chemical & Dye Corp., will build another plant at Round Bottom, W. Va., to produce aniline. In design and capacity, the proposed new unit will duplicate National's original plant at Round Bottom, which started production in Jan. '54.

Construction starts immediately: completion is scheduled by mid-1956.

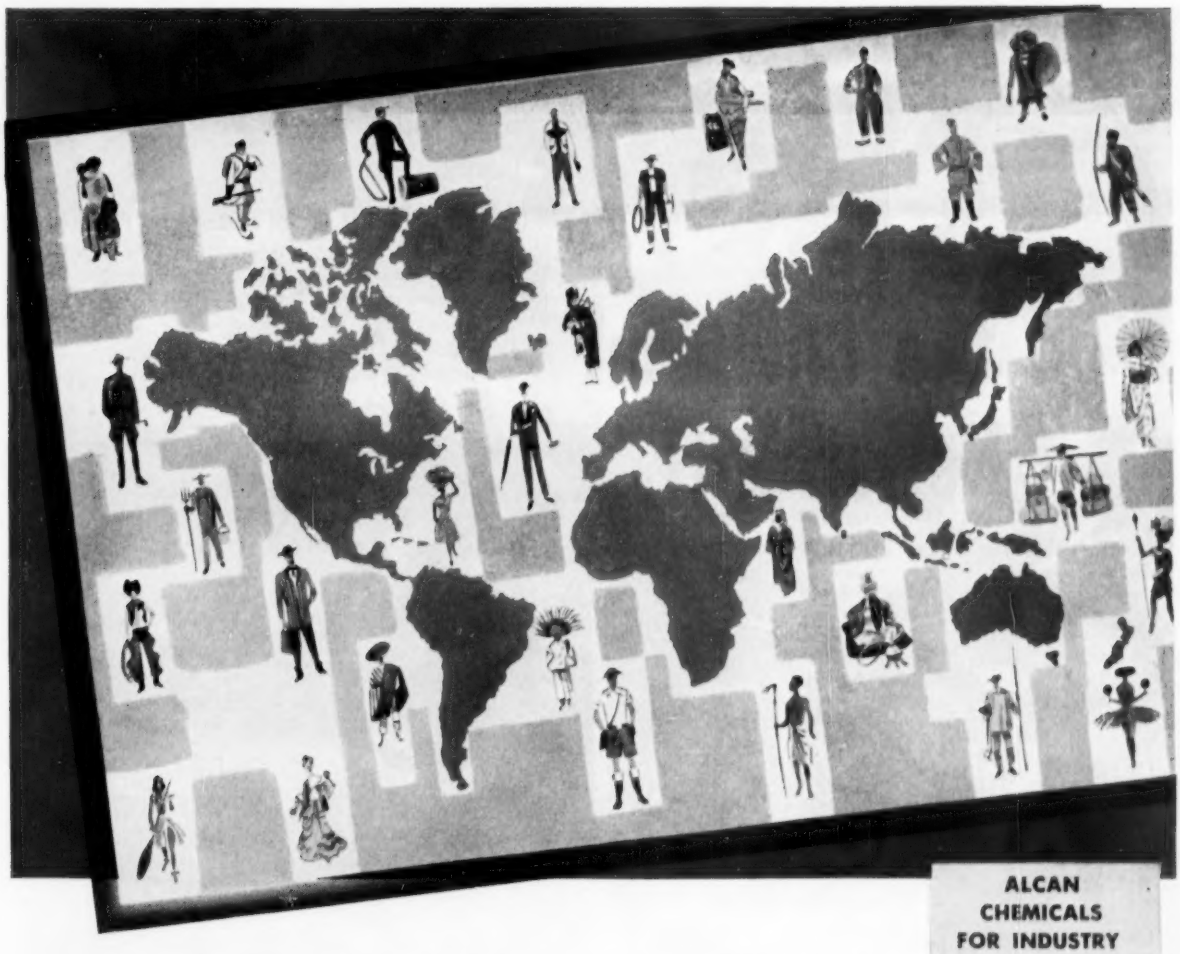
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Dairy Wax: Continental Oil Co. will expand its Ponca City, Okla., refinery to include an 11-million-lb./year dairy-wax plant. Cost: $500,000; estimated date of completion: early 1956.



More Scare than Danger

WHEN DEADLY chlorine gas billowed from Hooker's $15-million plant at Montague, Mich., last week a general alarm set in motion Michigan's entire civil defense evacuation program. Roadblocks were set up on U.S. Highway 31; children were evacuated from nearby schools; gas masks were distributed to the town's residents. The leak, however, was repaired quickly; damage was less than $5,000.



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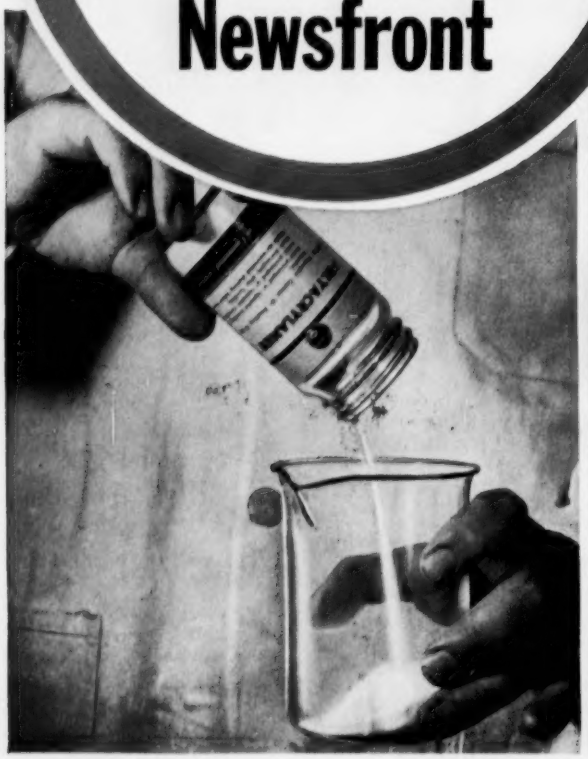
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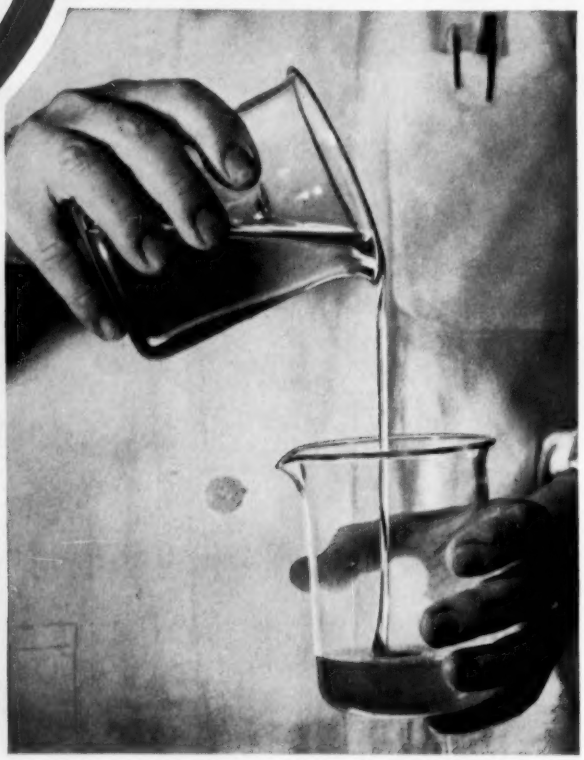
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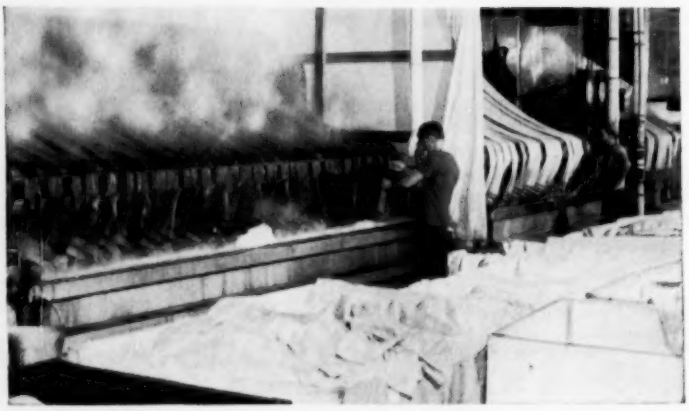
Life... on the Chemical Newsfront

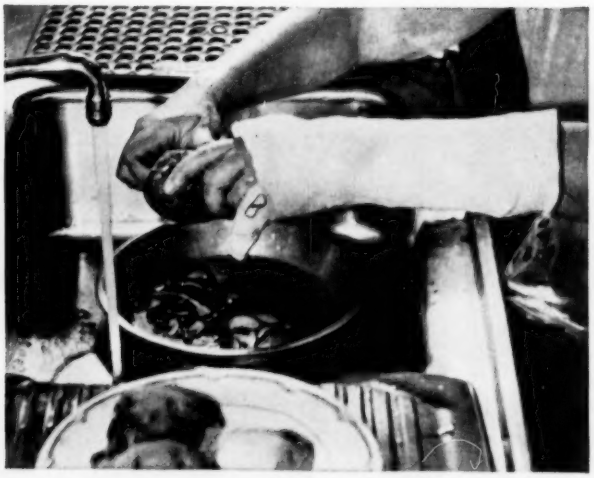
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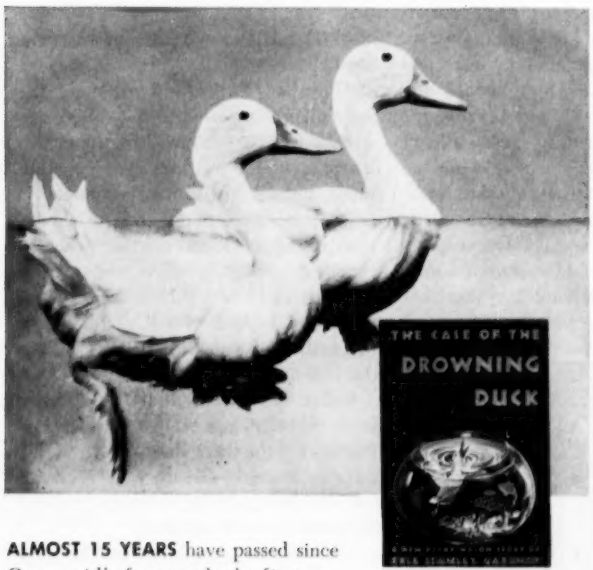


BETTER COLOR FASTNESS IN RESIN-TREATED FABRICS now is possible with Cyanamid's line of CALCODUR® Resin Fast Dyes. Unlike ordinary dyes, which are adversely affected when fabrics are resin treated for softness, wrinkle resistance and other qualities, CALCODUR Resin Fast Dyes actually *improve* in color fastness after treatment. Also, they offer ease of application to various types of fabrics containing cellulosic fibers either alone or in blends. (No. 2)





LIGHTWEIGHT CASTS FOR FRACTURE PATIENTS now are being prepared from a new cast material made from plastic resin and plaster of Paris. The new casts are lighter and thinner than ordinary casts, but provide four times the wet strength and twice the dry strength of materials used previously. As a result, they are more comfortable and less fatiguing, they encourage earlier mobilization, and permit clearer X-ray examination. Developed by Davis & Geck, Inc., a unit of Cyanamid, these casts are washable as well as water-, perspiration-, and urine-resistant. Doctors prepare the new casts quickly by merely wetting with water. (No. 3)



ALMOST 15 YEARS have passed since Cyanamid's famous ducks first appeared. Because this illustration explained wetting power so graphically, it was featured by the press and newsreels. In 1942, Erle Stanley Gardner made it the theme of his Perry Mason mystery, "The Case of the Drowning Duck." For 15 years, while our two ducks continued to mean wetting power to millions, industry has found use for AEROSOL® Surface Active Agents in thousands of processes and a progression of new uses. Among these uses are crystal growth modification, leak-testing tanks used to store liquids of lower surface tension than water, powerful new dry-cleaning detergents, and wallpaper removers. These and many other important applications are highlighted in our new booklet on AEROSOL Surface Active Agents. (No. 4)

News Briefs

OUTSTANDING PERFORMANCE IN SURFACE COATINGS is being reported for the new XA Polyester Coating Resins. Similar in composition to the unique polyester/glass-fiber plastics, XA Polyester Coating Resins are solutions in a reactive monomer such as styrene. Properly catalyzed, they cure to insoluble, infusible films in a few hours at room temperature. Since they cure without loss of volatile material or liberation of water, they can be applied in films up to 10 mils thick. Thick films reduce labor of finishing porous materials such as wood, fiberboard and masonry. XA Polyester Coating Resins also exhibit excellent resistance to chemicals, solvents and water. Since this type of polyester resin is a new development for the paint industry, only experimental samples are available at present. (No. 5)

CRUMBLED BATCHES OF OIL-EXTENDED GR-S STOCKS can be avoided by using PEPTON® 22 catalytic plasticizer for GR-S and natural rubber. PEPTON 22 also improves processing of stocks by reduction of viscosity during mastication. This means faster breakdown time, lower power consumption and reduced processing cost. The peptizing action of PEPTON 22 during hot mastication demonstrates its efficiency as a catalytic plasticizer. (No. 6)

BLACKHEAD DISEASE IN TURKEYS now is controlled more economically with new ENHEPTIN®-A 2-acetylamino-5-nitrothiazole. The new drug is more effective than the former ENHEPTIN® 2-amino-5-nitrothiazole. Extensive research among many groups of chemical compounds did not reveal a better drug than ENHEPTIN but its acetyl derivative, ENHEPTIN-A, was found to be more effective so that lower dosage may be used. The drug is supplied to feed manufacturers for proper distribution in feed, and is available to turkey raisers as medicated feed. It may be used at specified levels as a disease preventive, or at higher levels as a control after an outbreak occurs. Extensive tests have shown that the drug has no effect on breeding activity or egg production, and medicated birds grow and maintain body weight equal to unmedicated birds. Devastating blackhead disease no longer means disaster for turkey raisers; ENHEPTIN-A in medicated feeds controls it economically. (No. 7)

*Trade-mark

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CW

SEND more information on the following items mentioned in the June, 1955 issue of LIFE on the Chemical Newsfront:

No. 1, 2, 3, 4, 5, 6, 7.

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IN FAR WEST, student* gets 'arts' background . . .



IN NEW YORK, engineering class tests materials as program

MC GRAW-HILL

To Manage Materials—and Men

More engineers who can develop into executives—that's one aim of the "three-and-two" program in engineering education, a program that may provide a long-range solution to many a chemical company's perennial personnel problem: how to find qualified administrators.

The three-and-two program—meaning three years in a liberal arts college and two years in straight engineering—appears this week to be well on its way toward becoming almost universal among U.S. engineering schools. Already more than three dozen major schools of engineering are offering this program—often as an alternative to the older plan, which called for only a four-year, all-engineering curriculum. Leaders in engineering education like Columbia University's Dean John Dunning and New York University's Dean Thorndike Saville back the new plan to the hilt.

However, three-and-two is not the only plan being used to give engineers a broader background, fit them for larger roles in industry. At Philadelphia's Drexel Institute of Technology, Dean Emeritus Robert Disque has devised a supplemental reading program that's intended to give engineering students more of a "three-dimensional education." And the University of Minnesota has a variation that it calls the two-and-three plan.

Influx into Management: As every large chemical company knows, and as Professor John Bell Rae of Massachusetts Institute of Technology recently told a meeting of the American Society of Mechanical Engineers:

"One of the significant factors that have emerged (from a study on engineers as businessmen) is that during the past half century there has been a steadily increasing flow of engineers into positions of executive responsibility in industry." He calculates that the present-day engineering graduate has about one chance in two of moving into management.

Industry also has recognized a need for more leaders who can ex-





ENGINEERS/EXECUTIVES: Alumni Chilton (Du Pont), Davis (Cyanamid).

* Sophomore James Young with Professor W. J. Hutchings, Whitman College.



LYN CRAWFORD-MC GRAW-HILL



MC GRAW-HILL

Directors** watch . . . AT NEW ORLEANS, graduate† gets start in industry.

plain science and industry to the public—in the words of Du Pont Vice-president Henry du Pont, there's a need for "missionaries, so to speak, carrying the message and the promise of technology to all people." He called for greater understanding by the engineer of social problems, greater understanding by society of engineering problems.

A Second Objective: All this is in close accord with the report—out this month—of a committee set up three years ago by the American Society for Engineering Education to evaluate current patterns in education for engineers.

A big objective, the committee finds, "includes the development of leadership, the inculcation of a deep sense of professional ethics, and the general education of the individual." Required for these purposes: an understanding of the evolution of society and of the impact of technology on it; an acquaintance with and appreciation for the heritage of other cultural fields.

ASEE also is conducting a case study on the efforts made by various colleges of engineering for introducing certain humanities studies into the engineering curricula; and a preliminary report on this project also is due this month.

** At right, Professor Frank Lee and Associate Dean Wesley Hennessy, Columbia.
† Production supervisor Charles Hendershott, American Cyanamid plant, New Orleans.

Collegiate Link-ups: Probably no engineering school has ever totally excluded liberal arts courses, but now there's a strong trend toward increasing this phase of engineering education. Columbia's School of Engineering probably was the first in the three-and-two field, launching its program back in 1916. For 35 years, that program was primarily a dual partnership between the engineering school and Columbia's men's undergraduate college; but starting in 1951, additional liberal arts colleges have joined the link-up. As of this week, there are 43 such colleges across the nation sending pre-engineering students to Columbia.

How this plan works is illustrated in the accompanying pictures. At the arts colleges, students get basic mathematics and sciences as well as humanities, and those who lack engineering aptitude are steered into other fields. On the Columbia campus in New York City, it's straight engineering for two years. Graduates go directly into industry; and some of them—like T. H. Chilton, head of Du Pont's Engineering Dept., and C. P. Davis, manager of Cyanamid's Technical Dept.—move up into executive positions.

To the young engineer, it's just a matter of learning to manage both of the prime components of industry: men and materials.

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Fuel to the Fire

Adding its faggots to the already-incendiary alien-property seized-assets struggle, a special committee of the American Bar Association last week came out four-square against any restoration of seized enemy assets. And its report, whether or not it is adopted by the entire Bar Association meeting in Philadelphia next August 23, is a blow to those working in Congress to get a bill which might mean eventual return to Germany of such properties as General Aniline & Film Corp.

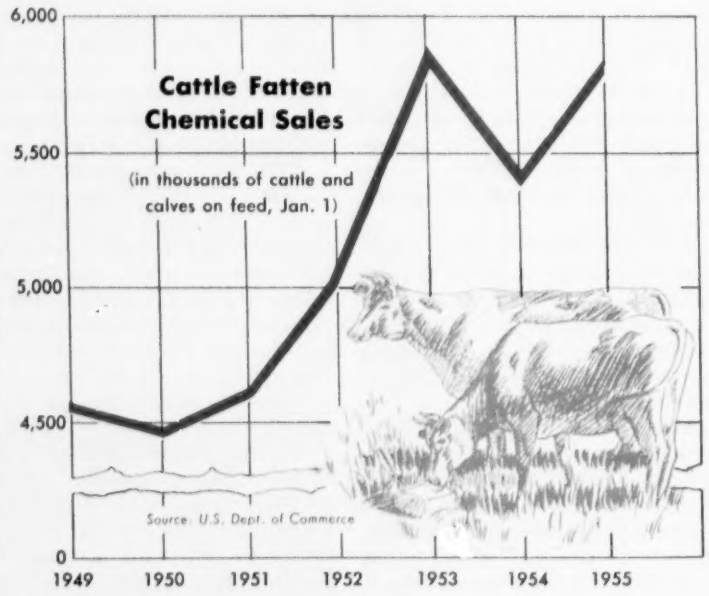
Chief tenets of the three-man special committee (headed by Victor Folsom, counsel for Sterling Drug, Inc., New York):

- No rule of international law requires return of war assets, and to do so would be to violate postwar agreements with Germany and the United States' 17 other allies.
- Basically, seizure of enemy assets does not represent confiscation, and hence restoration is unnecessary.
- According to the 1946 reparations meeting at Paris, it was agreed that seized properties would be kept by the 18 allies in place of any reparations claims against Germany.

The 14-man council of the American Bar Association which heard the Folsom report is currently circulating it for reading by all section members. Action, it insists, won't be taken until August—by which time all members will have had sufficient time to study the findings. (And even then, a big wrangle is expected, since many lawyers openly take an opposite view.)

But meanwhile, there's open jubilation among members of the antirestoration camp. Reason: regardless of the final outcome, Folsom's committee has supplied them with a number of strong arguments.

IMPACT



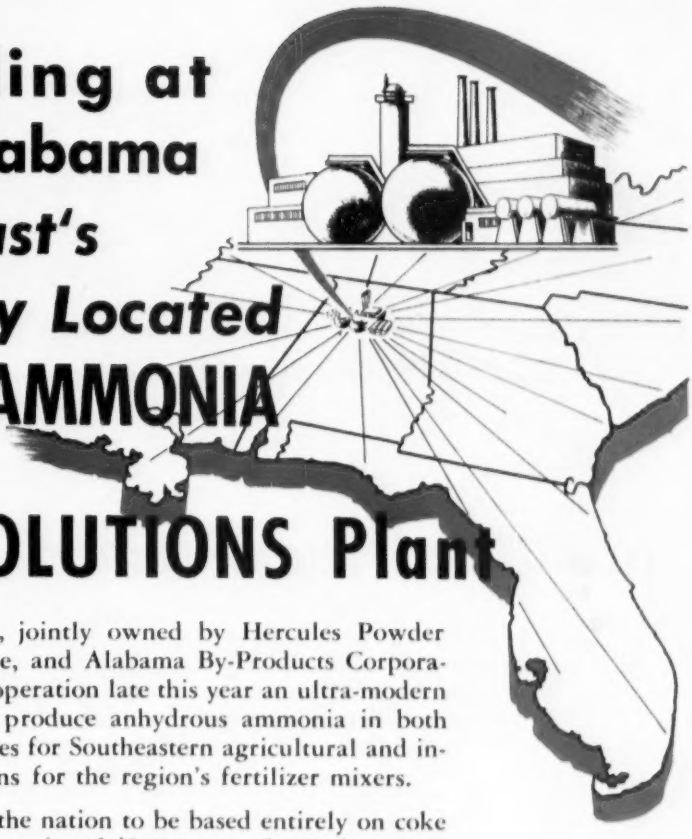
More Than Table Meat

CHEMICAL SUPPLIERS can eat their beef and have it, too, in the form of today's profits on sales to cattle raisers. Reason: with population curves turning upward sharply, farmers are using ever-heavier quantities of cattle-feed nutrients. Latest estimate of potential consumption of chemicals by the U.S. herd on feed: some 52,200 tons of salt, 290,000 tons of dicalcium phosphate, 185,000 tons of limestone, 68,000 lbs. of hormone compounds and 33,000 tons of urea (the latter two used for fattening), and 352 tons/year of antibiotics.

Now Building at Ketona, Alabama

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ANHYDROUS AMMONIA and NITROGEN SOLUTIONS Plant



Ketona Chemical Corporation, jointly owned by Hercules Powder Company of Wilmington, Delaware, and Alabama By-Products Corporation of Birmingham, will place in operation late this year an ultra-modern new plant at Ketona, Alabama, to produce anhydrous ammonia in both commercial and refrigeration grades for Southeastern agricultural and industrial needs and nitrogen solutions for the region's fertilizer mixers.

The plant will be the first in the nation to be based entirely on coke oven gas. It will have an initial capacity of 45,000 tons of anhydrous ammonia, and nitrogen solutions in formulations preferred by fertilizer mixers in the Southeastern territory.

New Plant to Offer These Outstanding Advantages

Fast Deliveries — Lower Shipping Costs—Strategically located at a suburb of Birmingham, the geographic center of the fast growing Southeast, the plant will be able to save many users of its products time and money on delivery costs. This is an increasingly important factor in these highly competitive times.

Dependable Source of Supply—Coke oven gas, the plant's source material, will be drawn from the close-by Tarrant Coke facility of Alabama By-Products Corporation, the nation's second largest strictly commercial plant.

Responsible Ownership—Joint ownership and supervision by two of America's large, nationally-known companies and an experienced management and staff will assure maintenance of quality standards at all times.

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For further information on how this centrally located Southeastern plant can serve you economically and efficiently, write Alabama By-Products Corporation, Sales Agents, P. O. Box 354, Birmingham, Ala.

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AIR BOUND: With executive beats harder to patrol, chemical companies find private planes one answer.

Sprouting Bigger Wings

Ask almost any chemical executive how he manages to keep tabs on far-flung business operations today, and chances are he'll credit company-owned planes. In fact, that sentiment is so widespread that chemical companies with air wings now total some 10% of the 6,000-odd business organizations owning and operating aircraft* in the U.S.

That's a boost of 300% over the number of industry-owned planes 10 years ago. And the trend's growing steadily. Right now business craft fly more air miles, employ more pilots, require more ground personnel than the national airlines themselves. Last year alone, for example, business planes flew 700,000 hours more than scheduled domestic flights.

Reasons Aplenty: Why do increasing numbers of chemical companies prefer their own planes rather than using chartered or scheduled air services? One answer: with industry shunning urban centers, plants and customers are becoming progressively more inaccessible. Standard travel by rail and car doesn't adequately solve the problem because of time, distance and fatigue factors. Then too, national airlines limit chemical executives in getting to out-of-the-way spots because big planes stop only at some 600 of the more than 6,000 airfields dotting the country. Obvious solution: company-owned planes.

Commenting on present-day advantages of chemical-company-owned craft, Richard Lane, chief executive pilot for Food Machinery & Chemical Corp. (New York), has some further views. "Don't forget too," he states, "even smaller planes these days can be equipped to serve as aerial offices, making work enroute more attractive to executives." He speaks from experience because Food Machinery has been operating company - owned planes for years. Included in the FMC fleet now: a twin-engine Douglas B-23, a Beechcraft A-18S, and a recently acquired Cessna 180.

Not to be overlooked on the credit side also: company-owned planes build good public relations with customers and business associates, serve as 24-hour/day prestige builders for the owner company.

Here's the Catch: This doesn't mean to say that every chemical company not owning a private plane now should rush out and invest in a fleet to get the jump on its competitors. There's still a big hitch . . . of a monetary nature.

Company-owned planes are still fairly expensive to own and operate, cost more than scheduled air transportation. One major East Coast chemical manufacturer estimates operating costs at $218,700 for two DC-3s flown a total of 1,100 hours last year. Another Baltimore company pegs the price for a similar plane at $115,000 for 500 hours.

Approximately 35% of costs goes for gas and oil, 26.7% for experienced pilot and copilot salaries, 8.3% for complete insurance coverage and 30% for plane upkeep.

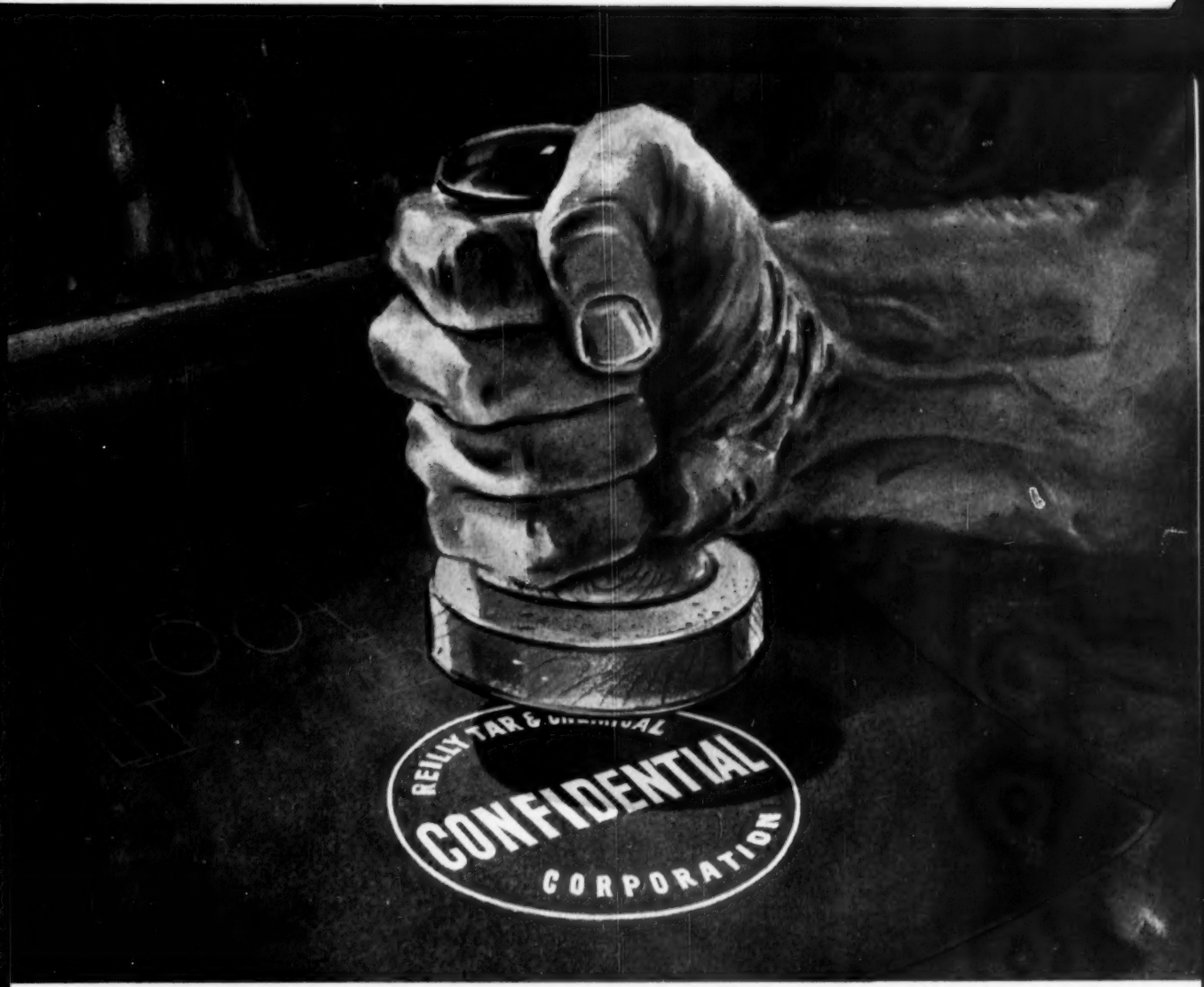
Larger planes, like the Douglas B-23, run owners about $200/hour ($1/mile) on operational costs for 500 hours use per year. Smaller Beechcrafts are cheaper, about $100/hour (60¢/mile). Even tiny single-engine Cessnas take about $39/hour (30¢/mile).

Still another problem today to be considered before investing in private planes: the market's fairly tight as far as good pilots and flight personnel are concerned. Reason: company plane operators have to be more adaptable than regular airline pilots. They're really one-man airlines, doing everything from flight planning to maintenance. Besides, companies expect them to be goodwill representatives. Even at salaries running anywhere from $7,200 to $18,000/year, suitable company pilots are hard to find.

Hard to Outreason: Despite obvious high investment and pilot shortages, however, chemical companies continue to buy planes. One determining factor in making the service pay off: steady usage throughout the year (at least 500 hours), and easy availability to all executives who need plane transportation. Otherwise, as one firm ruefully points out, the expense of a company plane can boomerang. Stockholders, yet to be educated in the exigencies required in business today, often regard a company plane as a needless luxury. To be convinced of its necessity, the company needs proof that private-plane travel pays off.

That proof's readily available, most companies claim. And within the next few years, the number of firms operating their own air fleet should continue to increase—perhaps as much as 50%.

* Estimated at 12,000 or more.



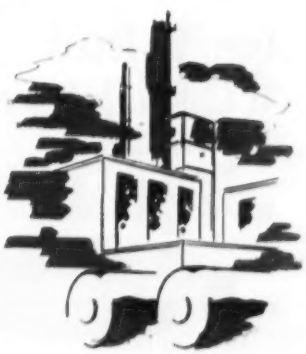
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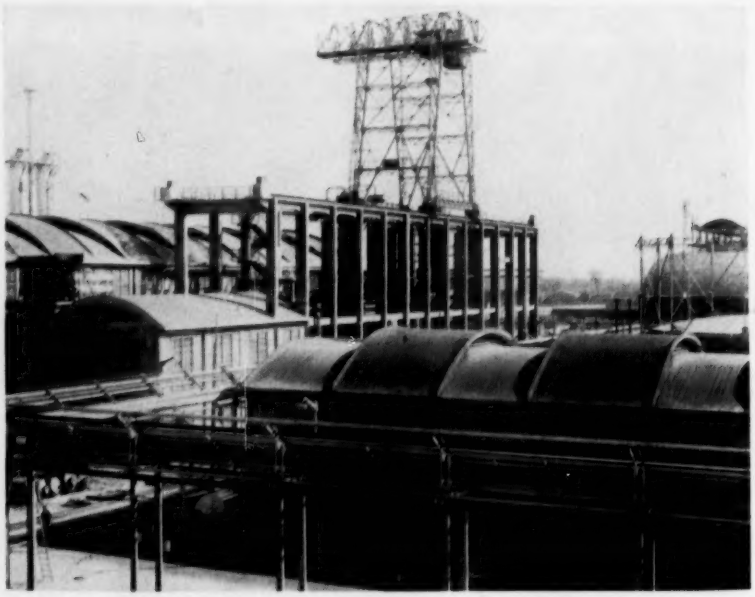
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NOVARO AMMONIA SYNTHESIS UNITS: Model for plant Montecatini will build for Sindri in India.

FOREIGN. . . . . .

Italian-Indian Pact: Sindri Fertilizers & Chemicals Co. (Sindri, India) has placed an order with Ansaldo Co. (Genoa) and Montecatini (Milan) to build a 190-ton/day ammonia plant at Sindri. Cost: $13 million.

The new plant, when built, will also have a daily output of 225 tons of nitric acid, 400 tons of ammonium nitrate, and 70 tons of urea.

Montecatini engineers will be sent to India to train Indian nationals to operate the plan; contracts call for completion of construction within three years.

•

Fertilizer/Korea: McGraw-Hydrocarbon, Inc., has been awarded a contract to design and build a $25-million fertilizer plant in Korea. Financing will be handled by the Foreign Operations Administration; capacity: 85,000 tons annually—nearly one-third of Korea's present agricultural requirements.

Most likely plant site: in the Chung-Ju area—nearly 80 miles southeast of Seoul on the Han River. Estimated date of completion: Jan. '57.

•

Sulfuric Acid/Mexico: Additional information is now available on plans for Monsanto Mexicana's sulfuric acid plant in Lecheria. Ground-breaking ceremonies will take place this month; production is expected to get under way next March. The plant will be built by one of Monsanto's licensee construction firms and will use the vanadium catalyst process patented by Monsanto.

•

Inviting Capital: The Ministers of Economy of the five Central American Republics met last month in San Salvador to discuss means and methods of obtaining closer economic cooperation between their various countries.

High on the discussion list: suggestions as to how to attract more foreign investment (chiefly American) in development of Central American industry; and plans for construction of a paper and cellulose industry.

•

Exports/Japan: Japan exported 552,754 tons of ammonium sulfate, valued at over $32 million, in fiscal 1954. This constitutes a 173,774-ton increase over 1953.

Largest consumer: Formosa (which imported 290,500 tons, or more than 50% of the total) followed by South Korea (with 164,492 tons) and Communist China (with 71,426 tons).

What's worrying Japanese producers: where they'll find markets this year, if Formosan and Korean sales continue to fall off.

NM
CH_3NO_2

NE
$CH_3CH_2NO_2$

THE CSC NITROPARAFFINS

New Stars

to give new direction

to the chemical industry

2-NP
$CH_3CHNO_2CH_3$

1-NP
$CH_3CH_2CH_2NO_2$

PHYSICAL PROPERTIES

	NM (Nitromethane) CH_3NO_2	NE (Nitroethane) $CH_3CH_2NO_2$	1-NP (1-Nitropropane) $CH_3CH_2CH_2NO_2$	2-NP (2-Nitropropane) $CH_3CHNO_2CH_3$
Molecular Weight	61.04	75.07	89.09	89.09
Boiling Point at 760mm, °C	101.2	114.0	131.6	120.3
Azeotrope with Water, bp, °C	83.6	87.1	91.2	88.4
NP in azeotrope, % by weight	77.1	73.6	64.5	73.1
Vapor Pressure at 20°C, mm	27.8	15.6	7.5	12.9
Evaporation Rate, by volume*	139.0	121.0	88.0	110.0
Freezing Point, °C	−29.0	−90.0	−108.0	−93.0
Specific Gravity at 20/20°C	1.139	1.052	1.003	0.992
Density of Vapors (air = 1.00)	2.11	2.58	3.06	3.06
Weight per U.S. Gallon at 68°F, lb	9.48	8.75	8.35	8.24
Coefficient of Expansion, per °F	0.00064	0.00062	0.00056	0.00058
Refractive Index, n_D at 20°C	1.3818	1.3916	1.4015	1.3941
Surface Tension at 20°C, dynes/cm	37.0	31.3	30.0	30.0
Heat of Vaporization at 30°C, calc., cal/g	143.3	124.8	107.3	104.4
Heat Capacity at 25°C, cal/g	$0.422^{30°C}$	0.441	0.471	—
Dielectric Constant at 30°C	35.76	28.00	23.22	25.48
Ignition Temperature, °F	785.0	778.0	789.0	802.0
Flash Point, °F (Tag Open Cup)	112.0	106.0	120.0	103.0
pH 0.01M Aqueous Solution at 25°C	6.4	6.0	6.0	6.2
Solubility in Water at 20°C, % by volume	9.5	4.5	1.4	1.7
Solubility of Water in NP at 20°C, % by volume	2.2	0.9	0.5	0.6

*N-Butyl Acetate = 100

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AMPD (2-Amino-2-methyl-1, 3-propanediol)
AMP (2-Amino-2-methyl-1-propanol)
NB (2-Nitro-1-butanol)
NEPD (2-Nitro-2-ethyl-1, 3-propanediol)
NMPD (2-Nitro-2-methyl-1, 3-propanediol)
NMP (2-Nitro-2-methyl-1-propanol)
ALKATERGES
TRIS AMINO (Tris [hydroxymethyl] aminomethane)
TRIS NITRO (Tris [hydroxymethyl] nitromethane)
HAS (Hydroxylammonium Acid Sulfate)
HC (Hydroxylammonium Chloride)
HS (Hydroxylammonium Sulfate)

SAMPLES ON REQUEST

Here are the Nitroparaffins – NM(Nitromethane), NE(Nitroethane), 1-NP(1-Nitropropane) and 2-NP(2-Nitropropane). These four NP's have a potential range of usefulness unequalled by any other group of organic chemicals! CSC's new Nitroparaffin plant at Sterlington, La., will be on stream with increased volume starting August of 1955.

In many cases, they provide better and more economical methods of manufacturing well-known and widely used industrial chemicals. However, the majority of the reactions yield entirely new compounds. There are practically an unlimited number of products which can be prepared from the NP's. As solvents, they present an unusual combination of properties – they are medium-boiling, mild-odored and, most important of all, they have strong solvent power for a wide variety of substances, including many coating materials, waxes, resins, gums, dyes, fats and oils, and numerous organic chemicals. The CSC Nitroparaffins are chemistry's newest stars. They give new direction to the production of old products and the development of new.



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WIDE WORLD

GEORGE: Quite satisfied that . . .

The Fight's Over

The four-month fight in Congress over President Eisenhower's three-year foreign trade bill ended this week with both "protectionists" and the Administration reasonably well satisfied with the outcome.

At midweek, House and Senate conferees had agreed on everything except possible minor changes in the language of the escape clause and of the Senate amendment giving the President power to limit imports of specific commodities in the interests of national security.

But the major decisions now have been made and it's possible for industry to evaluate the probable impact of the new trade bill. The chemical industry, on balance, fared pretty well. Deletion of the provisions that would have permitted tariff reductions on over 300 items involved in the current Japanese negotiations at Geneva removed a major source of concern for the industry. A long list of intermediate coal-tar products and other synthetic organic products, which are up for negotiation now under existing tariff-cutting authority, would have been eligible for further cuts under the new authority under the provision.

Another proposal, cut out in the Senate, largely though the efforts of Senator George (D., Ga.) permitting 50% tariff cuts on items being imported in only negligible volume also had worried segments of the chemical industry producing products for which current import volume is low.

As things now stand, the tariff bill will permit only modest tariff reductions over the next three years. Duties on two-thirds of the number of dutiable commodities imported representing 90% of the value of all dutiable imports can be cut a maximum of 4% ad valorem over three years under the new law. At the same time, liberalization of the escape clause will make it much easier for domestic industries threatened by imports to get tariff relief.

LABOR. . . . . .

Everybody Eligible: Increasing importance attached by management to ideas-from-employees plans is reflected in current doings at American Can Co. and Standard Oil Co. of New Jersey.

• Canco is setting up a new employee suggestion system in which every employee—up to and including the president—will be eligible to compete. A full-time manager has been named for the plan, which was drawn up after a two-year study of other industrial companies' programs. Awards will be based on 20% of first year's gross savings at each location where the suggestion is used, up to the $10,000 maximum.

• Esso had a record year in payments on employee ideas last year, sending out checks for a total of more than $121,000 to some 2,700 employees. Top winner—a process operator in Esso's Bayway refinery—received $7,500 for a suggestion on a heat exchange method.

•

One-Day Walkouts: Two wildcat strikes at chemical process plants last fortnight lasted just one day each: the 435 production and maintenance employees of R. M. Hollingshead Corp. at Camden, N. J., and the 150 hourly paid employees of General Mills' O-Cel-O Division at Tonawanda, N. Y., returned to their jobs the same day.

•

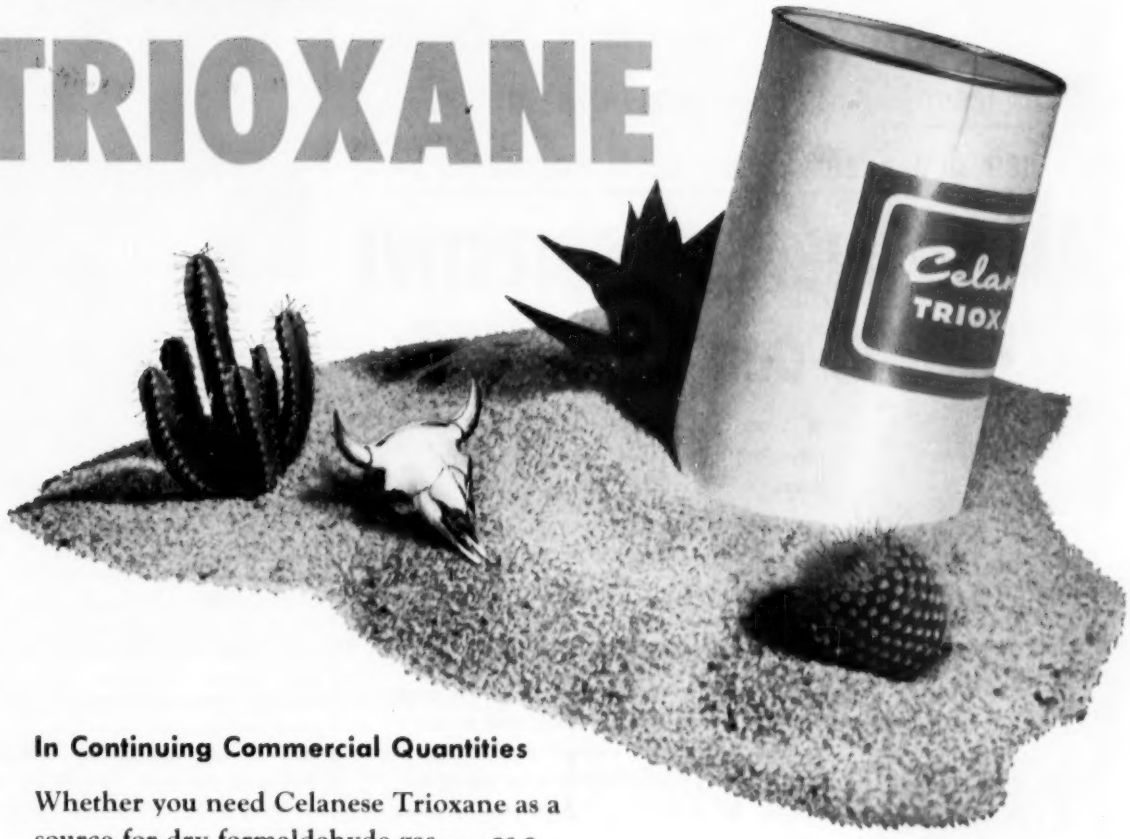
Safety Sessions: More and more attention is being paid to industrial health and safety planning, with two new conferences on the subject being announced last week. The Atomic Energy Commission has invited state officials to a session on health and safety regulations for industries using radioactive materials; and the first

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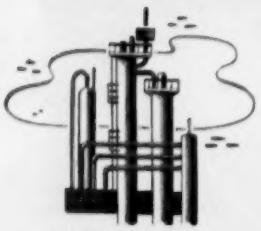
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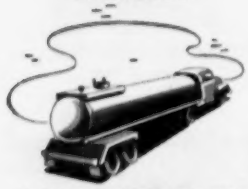
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CHRISTIANSON & LEBERMAN

MAVERICK: In labor law showdown, a plug for unions.

Genesee Valley Safety Conference will be held in Rochester, N.Y., next April 17-19.

•

Stiffer State Laws: Chemical and petrochemical companies along the Texas Gulf Coast will find their labor relations affected by stricter state labor regulations if they are passed—as now seems likely—in the state legislature at Austin. In fact, one of the three labor bills sponsored by state Sen. George Parkhouse has already been passed. It would deny unemployment compensation to union members who are idled because of a strike by their own union at some other plant of the same company—in Texas or elsewhere.

A second bill would forbid picketing to force an employer to recognize a union unless that union has convinced a state court that it actually represents a majority of employees in the proposed bargaining unit. The third Parkhouse bill would widen the possible use of injunctions and damage suits in case of strikes.

Gov. Allan Shivers has endorsed these proposals. Principal opponent of the measures: state Rep. Maury Maverick, of San Antonio, who says these "antilabor bills" would not be effective. Maverick—often a supporter of union-approved measures—says that organized labor in Texas has agreed to accept a state law based on Taft-Hartley; but that "punitive class-hatred legislation as recommended by the governor" is not the answer.

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Phosphates, Barium and Magnesium Chemicals



DAVIES, MARES: First president and managing director of Petro-Tex are . . .

Off to a Running Start

First major project of recently formed Petro-Tex Corp. will be to build research facilities—somewhere in the New York area.

Why? Company officials feel the greatest single need for a new company entering the petrochemical field today is a strong, productive research unit.

When Petro-Tex Corp. was formed in Houston last week to operate the former government-owned butadiene plant recently acquired jointly by Tennessee Gas Transmission Co. and Food Machinery & Chemical Corp., it was off to a start not normally accorded fledgling chemical companies. Company officials have, as a starter, not only production from the second largest butadiene plant in the country, but also free rein to turn a substantial portion of its profits (estimated at $25 million annually) into construction of basic research units.

The plant, with which Petro-Tex starts operations was actually sold by the government to FMC in April for $24.1 million, but Food Machinery even then had contracted with Tennessee Gas for equal participation in the purchase price. Further: arrangements had been made with Goodyear Tire & Rubber Co. (then angling to buy an adjoining rubber plant) to assure no break in sales contracts.

Output of butadiene, Petro-Tex spokesmen claim, is now running about 90,000 short tons/year, but that's due to be stepped up soon, too. Best estimate: a butadiene capacity of 135,000 short tons within the next five years.

Big Plans: As far as building research facilities are concerned, company officials are equally optimistic. They expect to agree on final plans within the next month, will start construction by Dec. '55. Cost of research units, they figure, will be about $1.5 million, and annual operating costs about $1 million.

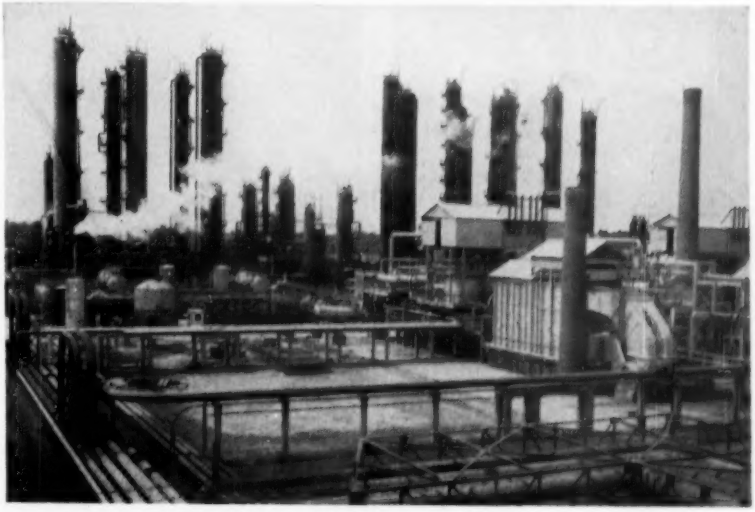
But the price should reward the effort. Reason: Petro-Tex expects to make major inroads on the petrochemical field in the years ahead, and therefore must get a fast start on new products.

Team Forming: Heading the Petro-Tex management team, in its broad planning projects: Paul L. Davies (president of FMC) and Joseph R. Mares, former vice-president of Monsanto Chemical Co. Staff of the Houston Ship Channel plant (under government ownership) has been retained, however; only top-level officers have been added to form a complete company line-up.

That's another strong point in the company's favor—one management official points out. With plant personnel remaining on the job, Petro-Tex can count on uninterrupted production schedules.

Raw materials should offer no difficulty, either. Petro-Tex has a long-term contract with Sinclair's nearby refinery to supply necessary feed stocks; TGT units are nearby if any shortage occurs.

FMC Debut: Formation of Petro-Tex marks Food Machinery's debut on the Houston industrial scene. TGT, however, is an old-timer in the area. Their combined efforts should be an interesting development to watch.



NOW IN OPERATION: Butadiene units—producing 90,000 tons/year.



MAJOR HANDICAP: Inexperienced workers . . . mostly emigrants from the Middle East . . . supply mining labor.

No Pause for Plaints

In Israel's budding chemical industry, great stress these days is being laid on developing mineral resources. Reason: over 60% of the nation's basic chemical requirements are still met by overseas producers; government officials are convinced that to develop indigenous raw materials is to put Israel well on the road to economic independence.

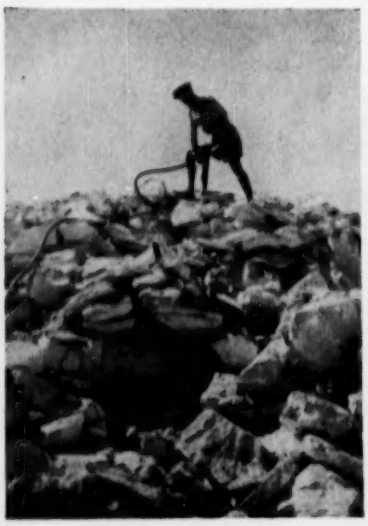
Two major handicaps, however, prevent industrials from making much progress—fast: lack of funds stymie all but the largest producers; and there's still a severe experienced-manpower shortage—particularly among chemists and chemical engineers.

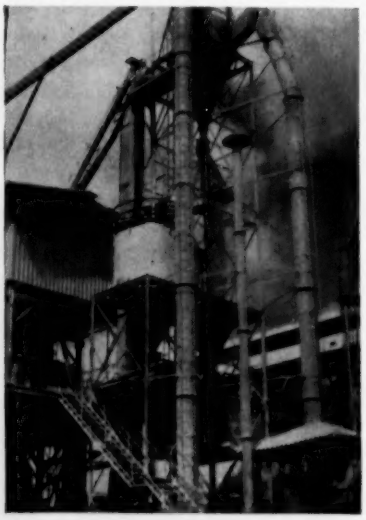
Two Extremes: That some progress is being made is obvious, though. Whereas the most primitive methods are used in processing kaoline, fertilizer plants near Haifa match modern U.S. facilities (*see cuts, left*).

Backed by foreign capital (much of it from the U.S.) several manufacturers today are mining phosphates in the Negev, transporting the raw material to Haifa for processing. But the long haul from mines to manufacturing units is costly—and almost impossible for the small company to finance.

Manpower Problem: The scarcity of trained chemists, engineers is another thorny problem to solve. Israeli government officials are trying to entice foreign-born specialists to Israel, but as yet their efforts have been relatively unsuccessful. Unskilled labor, moreover, is mostly emigrant labor from the Middle East. Longer-entrenched Israeli citizens prefer employment away from the arid desert areas; it's hard for mining companies to keep workers in the field long.

Despite all obstacles, though, Israel's chemical industry is driving along. By 1960, government spokesmen say, annual export quotas will be cut considerably—perhaps as much as 15%.





PHOSPHATES: Are mined in the Negev, hauled to plants outside Haifa.



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A salute to the A. F. C. A. . . .

Cleveland—headquarters of The H. K. Ferguson Co.—plays host to the Armed Forces Chemical Association at its 10th annual meeting, June 16-17, this year. We pay tribute to this association for its fine work and wish it continued success.

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WIDE WORLD

SECRETARY McKAY: For U.S., a $6 billion stake in leases, royalties.

LEGAL. . . . . .

U.S. vs. Louisiana: Whether certain oil and sulfur companies should make out checks to the U.S. or the state of Louisiana is to be decided in a motion newly filed in the U.S. Supreme Court at Washington. At issue: whether mineral-rich off-shore lands under the Gulf of Mexico are within Louisiana boundaries. Secretary of the Interior Douglas McKay estimates that lease and royalty payments on the disputed lands would be worth as much as $6 billion. Louisiana claims all submerged lands to a distance of three marine leagues—about 10½ miles—offshore; the U.S. government is asking the court to define the state limits as the three-mile mark.

•

Reversal on 'Dutch': Heading for the U.S. Supreme Court is the dispute between the Dutch Paint Co. (San Francisco)—a division of Manning-Mitchell Paint Co.—and the National Lead Co. (New York), maker of Dutch Boy brand paint products. In the first stage of litigation, a federal district court dismissed National Lead's complaint that use of the word "Dutch" in Dutch Paint's advertisements infringed the Dutch Boy trademark. Last fortnight, the Court of Appeals at San Francisco reversed that decision, granted an injunction halting use of the word "Dutch," and ordered Dutch Paint to make an accounting of profits to determine damages due to National Lead. Dutch Paint officials

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Night view of calcium carbide and acetylene generating plant, Calvert City, Kentucky.

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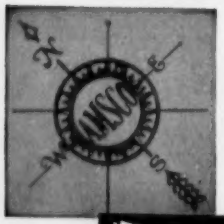
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B & I. . . . . .

have indicated that they will carry the fight to the Supreme Court.

•

Pollution Fine Quashed: The city of Buffalo, N.Y., has suffered a setback in its efforts to enforce its air pollution control ordinance. State Supreme Court Justice Regis O'Brien has reversed a city court conviction under that ordinance, thus quashing a $250 fine in the test case against Donner-Hanna Coke Corp. The company makes coke and coal chemicals in a plant built by the Army Ordnance Dept. in 1920, and—according to the court's finding—takes antipollution measures that are "exceptional in the industry." "The burden was upon the city to establish the alleged violation beyond a reasonable doubt," Justice O'Brien declared. He held that the city failed to produce "sufficient convincing evidence to sustain the conviction and fine."

•

Antitrust Revision: Company and trade association lawyers studying the recent report of the Attorney General's committee on antitrust law revision (*CW, April 9, p. 19*) now can read a 36-page condensation of the 394-page original. The brief version has been prepared by the Law Dept. of the National Assn. of Manufacturers so that management at large will be posted on these issues while they're being studied in Congress.

KEY CHANGES. . .

Robert Q. Parks, to general sales manager, Grace Chemical Co. (New York).

Jack H. Mohr, to general manager, Lentheric Division, Olin Mathieson Chemical Corp. (New York).

Roy G. Hemminghaus, to vice-president, production, Chemstrand Corp. (Decatur, Ala.).

J. W. Reid, to vice-president, Brown-Allen Chemicals, Inc. (New York).

Wilbur F. Jordan, to sales manager, and **Robert L. Bebb,** to manager, research and development, Synthetic Rubber & Latex Division, Firestone Tire & Rubber Co. (Akron, O.).

KUDOS . . . . . .

To **Ray P. Dinsmore,** vice-president, research and development, Goodyear Tire and Rubber Co. (Akron, O.), the 1955 Charles Goodyear Medal.

ATLAS chem-memos

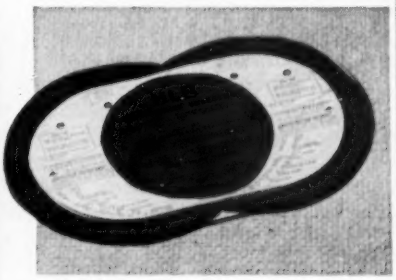
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Two time-savers in formulating emulsions

Products involving mixtures of water with oils, fats or waxes pose the problem of choosing an emulsifier or blend of emulsifiers. There are hundreds of emulsifiers available. To save time-consuming laboratory work in selection, Atlas offers several aids. Two are shown below. These selection helps are based on the Atlas HLB (Hydrophile-Lipophile Balance) System. In this system, each emulsifier has a numerical value indicating its attraction for oil or water; most types of emulsion problem have also been assigned such values, to indicate what value of emulsifier is best. By matching values, the choice can often be cut immediately by as much as 80 to 90% for any specific emulsification job.



72-page booklet, "A Guide to Formulation of Industrial Emulsions with Atlas Surfactants." Contains data on the HLB System and on Atlas emulsifiers. Lists 64 guide formulas for typical emulsions, including polishes, petroleum products, cleaners, protective creams, textile processing aids, paints, lacquers and miscellaneous industrial applications of wax and oil emulsions.



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We'll be glad to send you either or both of these time-savers . . . just write or call Atlas today.

Diagram Offered for Emulsion-Testing Device

Emulsions are classed as oil-in-water (O/W) or water-in-oil (W/O). Emulsions of "oil" (including fats and waxes) in water can be diluted or dispersed in water, or washed off with water; emulsions of water in "oil" are non-washable, dispersible only in oil. To the eye, or even under the microscope, an O/W emulsion may be indistinguishable from a W/O. During mixing, one type may change to the other, without the operator's being aware of it.

To assist in testing and evaluating emulsions, Atlas researchers use a simple testing apparatus that quickly shows whether an emulsion is O/W or W/O. It works on the principle that an O/W emulsion conducts electricity, while a W/O emulsion does not.

By means of this tester, the test emulsion is placed in a circuit with a lamp, which glows if the emulsion is O/W. The lamp will not glow with a W/O emulsion unless electrolytes such as sodium or aluminum chloride are present in the emulsion; or it may glow dimly if the dispersion is bordering on or gradually changing to O/W in character.

This tester is not supplied by Atlas, but we'll be glad to send you a diagram and instructions for making one.

New Booklet on Uses of Sorbitol in Confections

A 22-page booklet published by Atlas tells how manufacturers of confections and other foods can make use of the unusual qualities of sorbitol in their products. Results obtainable by using sorbitol to improve shelf life, reduce production losses and impart special taste and texture effects are fully described.

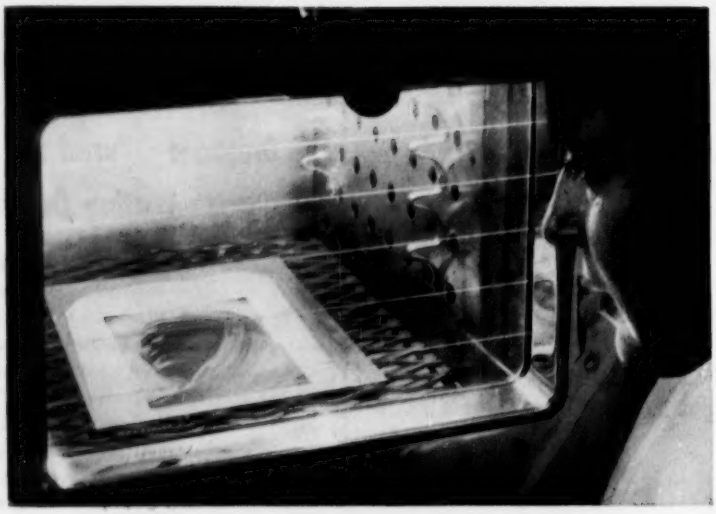
Suggested guide formulas are given for using sorbitol in marshmallows, nougats, fudge, caramels, creams, fondants, and whips for meringue, icing, etc. In addition, data is included on the use of sorbitol in special dietary foods for weight control and for diabetics.

Write to Atlas for a copy. Ask for CD-83.



target

Plastics with Vision



Photosensitive polyvinyls that could produce latent images just by heating would attract tonnage customers in droves today. That's—"if" the special plastics had (1) immediate response to ultraviolet, and (2) the ability to produce pictures and designs in true black, as well as colored, tones.

At present, films are far enough along to give clear, stable sepia prints, but initial exposure times run high (up to 1 minute). Whoever manages to work out the remaining, but tricky, chemical kinks will reap a big share of the 116-million-lb. market now existing for decorated vinyls (shower curtains, floor coverings, protective coatings, place mats). Moreover, he will find a major market in the military.

Customers Waiting: For one, the U.S. Army Signal Corps already envisions certain special uses for an acceptable photosensitive plastic film. Military field applications might include: quick photo print production and map duplication. (Because the films develop latent images by heating alone, they don't require wet developers thus eliminating the need for bulky equipment.)

In addition, the Signal Corps says, polyvinyl chloride prints "age" well. Because they're light-sensitive throughout (not coated with silver halides), positive prints have good abrasion resistance. Still another potential government use for photo vinyls: making millions of identification cards issued by various agencies (over 3.5 million/year are used by the military alone).

Many commercial operators would cheer a really fast true-tone photo plastic, too. Blueprint makers, for example, would welcome wear- and abrasion-resistant drawings. Shower curtain manufacturers could simplify their process by using photosensitive polyvinyl curtain materials.

Other not-too-far-fetched applications: making license plates (over 100 million metal plates were used in 1954); decorating floor coverings, designing place mats and wall finishes.

Basic Groundwork In: So far, one company (Ferro Chemical Co., Bedford, O.) is actively working with photo plastics.*

Chemically its process of making the films is simple, is based on the well-known principle that polyvinyl chloride liberates hydrochloric acid when struck by ultraviolet. Chlorinated paraffin added to the base polyvinyl resin furthers HCl generation.

Finely granulated (40 microns) aluminum oxide holds the hydrochloric molecules along the lines of light exposure until heat is applied. Then oxide combines with acid to form a highly active Friedel-Crafts catalyst, aluminum chloride. In turn, the catalyst triggers a naphthaquinone dyestuff progenitor to form stable sepia colors (the developed image).

To get a picture, researchers coat a pasty mixture (resin, plasticizer, diluent, chlorinated paraffin, progenitor, and oxide) on metal, obtain a peelable film by preliminary curing for five minutes. Next they give this film a one-minute exposure to light through an ordinary negative to put a latent image in the plastic. Then they heat the vinyl to 270-350 F and get a positive sepia picture.

Which Way Now? Beating the problem of slow exposure times will mean finding chlorine free-radical sources that are very unstable to light, but reasonably unchanged by heat.

More difficult, however, is getting over the other hurdle: to find organic chemicals of pale initial color that can react under Friedel-Crafts conditions to give stable black (and colored) images. Latest work suggests that chlorinated 1,4 quinone is one possible candidate in that it combines the functions of an HCl generator with a pigment-former.

Prospects look bright for anyone who successfully tackles and whips these problems. For, when photosensitive polyvinyls prove their worth they may well signal the advent of whole lines of photo plastics, maybe even photosensitive lacquers and paints.

* The films and process are called Calimar.



How "Dutch Boy" Chemicals help

the plastics industry

upgrade quality and reduce costs

Have you heard about the new *double-duty* "Dutch Boy" Plasticizers?

They make you wonder what National Lead Research will come up with next! Here, for the first time, are factory pre-balanced plasticizers that permit vinyl processors to obtain both low temperature flexibility and low volatility at the same time . . . without sacrificing any other property.

Want outstanding low temperature flexibility with good low volatility? "Dutch Boy" NL F-41 will give it to you. Want to reverse the emphasis? Go to "Dutch Boy" NL F-21. For very good overall performance, use "Dutch Boy" NL F-31.

It's as simple as that . . . and for makers of vinyl film, sheeting, extruded products, organosols and plastisols, down goes the cost of producing quality vinyl products. And "Dutch Boy" double-duty Plasticizers, made to the same high standards as "Dutch Boy" Stabilizers, simplify processing, too. No more need to use a half dozen plasticizers to obtain desired properties.

In vinyl plastisols, *Dutch Boy Bentone* gelling agents are helping the formulator control viscosity more precisely.

Should you care to explore the new vinyl formulating opportunities opened up by the "Dutch Boy" Plasticizers, or "Dutch Boy" Stabilizers, or *Dutch Boy* Gelling Agents . . .

Or if you would like to know more about other National Lead Chemicals . . . just fill out the coupon. Mail it attached to your letterhead, please.

*Reg. U. S. Pat. Off.



NATIONAL LEAD COMPANY
111 Broadway, New York 6, N. Y.

In Canada: CANADIAN TITANIUM PIGMENTS LIMITED
630 Dorchester Street, West · Montreal

Gentlemen:

Please send me the latest information concerning the uses of your new chemicals in the following fields:

_____

_____

Name _____

Title _____

Firm _____

Address _____

City _____ State _____

Buy **Dutch Boy® CHEMICALS**

...and get the plus of a name you know...for quality



VERSATILITY: A polyethylene for every need is Monsanto's goal.

Accent on Service

Campaign platforms are being laid with carefully chosen planks in expectation of brisk competition in polyethylene. Sales promotion plans skirt extravagant claims; instead emphasize service, product quality, and versatility.

As one candidate after another throws its hat into the ring, optimism still prevails; the conviction is that there will be enough business for all who can back their products with something more than promises.

To attract attention to its product, each firm, in one way or another, is attempting to distinguish its own from the crowd. Yet, on one point, all are in agreement—it is the part adequate technical service facilities will play in corralling business. This one factor usually overshadows other promotional plans, or at least occupies a very prominent part in every sales program.

For example, Du Pont's technical service was stepped up early this year with the opening of a polychemicals service laboratory (*CW, Feb. 26, p. 92*). Despite the firm's long experience with polychemicals, the obvious advantage of consolidating customer relations, and the inevitable need to solve new application problems in a fast-growing industry, indicated the necessity of increasing existing service facilities.

The other factor in Du Pont's double-barreled promotional campaign will be the continued development of "a full line" of polyethylenes. It already has a dozen or more Alathons (its tradename for polyethylene) from which the molder or extruder can select the one most suitable for his needs, and the series will be expanded to include a low-pressure polyethylene as soon as a new pilot plant is constructed.

Bakelite, another old-timer in the polyethylene business, has much the same attitude. Long experience in the field, it is felt, will carry the company a long way in its attempt to meet competition. But again, technical service is held important as evidenced by the opening of a new laboratory for the sole purpose of solving packaging problems (*CW, May 28, p. 60*).

These established producers are laying plans for future promotional activities, and a temporary soft-pedaling of aggressive publicity should give no illusion of complacency. Although Bakelite is now offering a low-pressure polyethylene in pilot-plant quantities, a spokesman admits that " . . . we are not making much noise about it." However, forthcoming advertising in magazines such as *Saturday Evening Post* and *Collier's*—to be aimed at the housewife on behalf of manufacturers of housewares—is scheduled and will recast the picture.

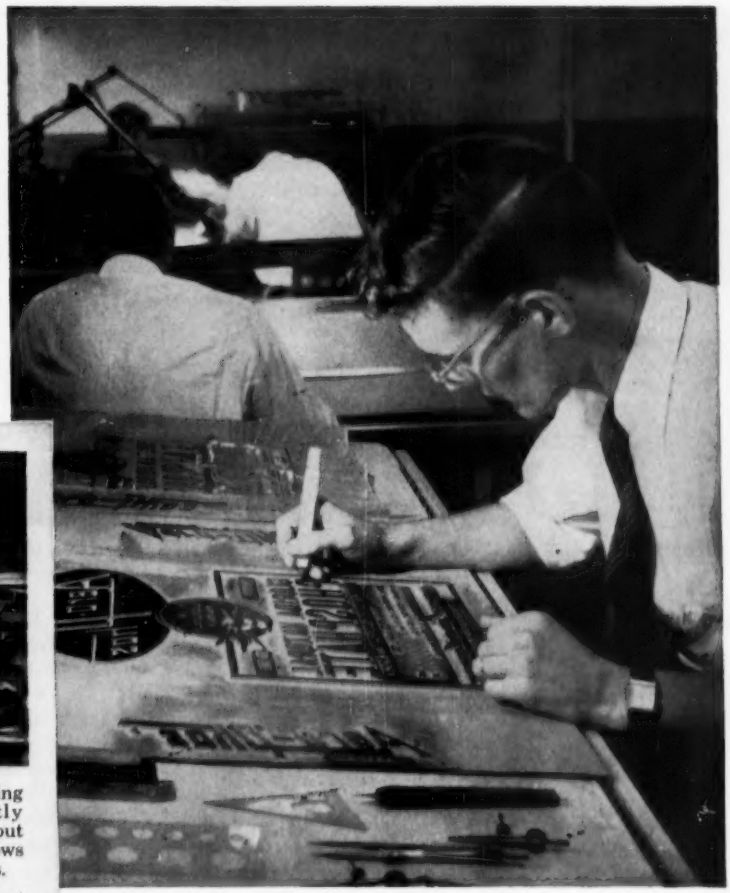
The promotion of Monsanto's line of Orizon high-pressure polyethylenes is still in the planning stage. Over the long range, the main sales angle will be the development of a line of resins with characteristics to meet all needs. Research is presently under way to develop a low-pressure polyethylene.

Monsanto and other newcomers to the polyethylene scene also stress technical service. Although they cannot point to past experience with polyethylene itself, some do emphasize experience in closely related fields. Eastman, for one, points to its 20 years' experience in Tenite acetate and butyrate as a sound foundation for handling technical service for problems pertaining to polyethylene.

In a similar position is Dow Chemical, whose polyethylene program is still in the early stages of production. It, too, assures the potential customers that research, technical service, and development teams backed by experience in molding, extrusion and coating fields will be available to provide competent service.

Although technical service is stimulated by the pressure of competition, it is not considered as little more than a necessary evil. To the contrary, as pointed out by a representative of

Making Your Bags is Our Full-Time Job



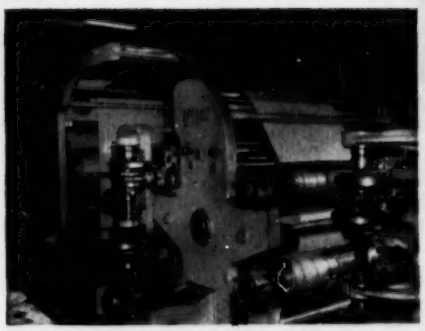
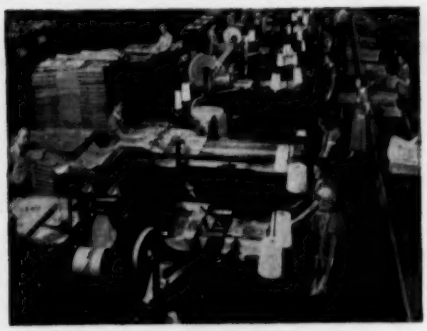


Photo at right shows V-C engravers making printing plates. Well-designed, expertly printed bags have real sales appeal—put your product out front. Photo above shows one of V-C's multi-color printing presses.



A battery of sewing machines staffed by highly-trained operators and inspectors. Modern machinery, skilled operators, and diligent inspectors, mean better-built, longer-lasting V-C Bags for your product.

THE BAG you use to package your product is only one of many items essential to your business success. But to the V-C Bag Division, the manufacture of better bags is a full-time job. That's why it will pay you to discuss your bag problems with a V-C representative. Possibly he can make suggestions that will improve or lower the cost of your packaging. Let him tell you about V-C's expert designing, printing, construction, and speedy service and delivery of V-C Multiwall Bags.

VC® BAGS

MADE AS CAREFULLY AS YOUR BEST TAILORED SUIT



Virginia-Carolina Chemical Corporation

BAG DIVISION: 9th and Perry Streets, Richmond 5, Virginia

DISTRICT SALES OFFICES: Atlanta, Ga. • Wilmington, N. C. • New York, N. Y. • E. St. Louis, Ill. • Cincinnati, Ohio



GREASE PENETRATION: One of many studies at Bakelite lab.

Spencer Chemical, cooperation with consumers will hasten the development of new uses for polyethylene—perhaps at a rate fast enough to absorb increasing outputs—with consequent rewards for all producers.

Meanwhile, sales promotion men are casting around for other ways to draw special attention to their products. Eastman, for example, lays considerable stress on the spherical shape of Tenite polyethylene pellets. It is claimed that in comparison with ordinary pellets, these flow more readily through hoppers, are easier to keep clean in storage and use, and have an estimated 10% lower bulk factor that saves on storage space.

Koppers is now pushing Super Dylan—a low-pressure polyethylene—with a vigorous campaign that emphasizes the differences between this product and the more familiar high-pressure polyethylenes. Its main properties include increased heat resistance (that allows heat sterilization), an ability to withstand high impact at low temperatures, and surface characteristics that minimize a waxy feel. These and other characteristics have been featured in a traveling road show built around a number of demonstrations designed to illustrate the claims made for the product. Also, plans for consumer advertising through magazines such as *Parents, Good Housekeeping*, and *Time* are in the making.

Spencer Chemical has used direct mail to reach industrial customers; also a magazine advertising campaign to familiarize the ultimate consumer with the firm's Poly-Eth trademark.

A somewhat different approach is used by U.S. Industrial Chemicals in its bid for customers for Petrothene. Attention is being drawn to technical problems that plague extruders; especially to difficulties that arise from polyethylenes that vary in physical characteristics from one batch to another and make frequent adjustment of fabrication procedures necessary. USI claims that such physical variations are held to a minimum in Petrothene because the material is manufactured in a completely integrated plant where production is based on a continuous process from the natural gas to the finished polyethylene.

Thus, growing competition accelerates promotional campaigning, but any candidate willing to do a reasonable amount of stumping is certain to win a healthy part of the business. What will happen when full production is attained and if newcomers swell the total output even more? No one seems particularly worried, although some do foresee a sizable surplus in the near future; each producer is apparently convinced of the versatility of polyethylene, and, even more, has considerable faith in the virtues of his product and of the growth potential of the entire market.

•

Expanding Sales Coverage: Eastern States Chemical Corp. is opening a terminal in Chicago to provide midwestern customers with the firm's line of aromatic and aliphatic solvents.

• Sylvania Division, American Viscose Corp., plans a new warehouse complete with service facilities, for the Los Angeles area to service cellophane consumers.

• Meyer Scientific Supply Co. has made arrangements with the United Parcel Service to handle deliveries in the Metropolitan New York, New Jersey and Westchester County area.



HEAT RESISTANCE: Credited to Koppers low-pressure polyethylene.

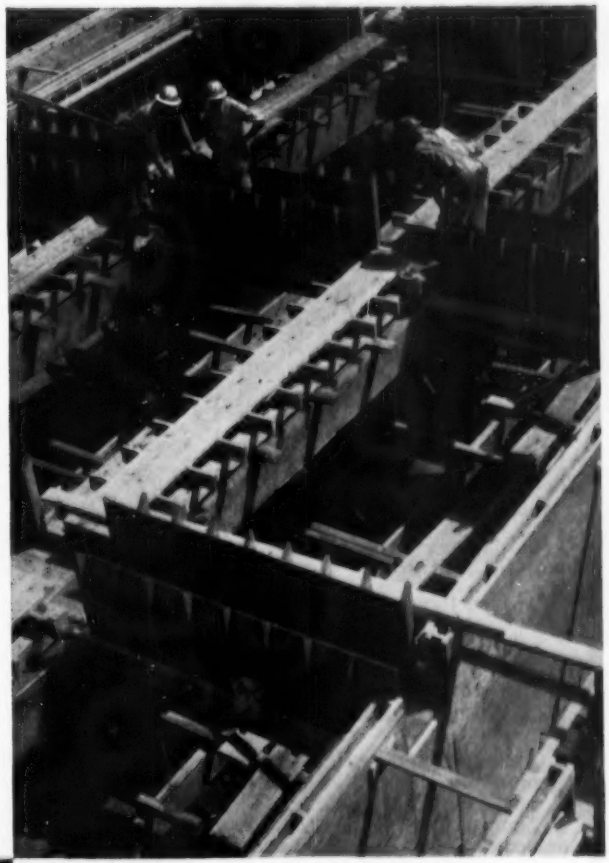


SPHERICAL PELLETS: Its form aids handling of Eastman's Tenite.

Dowicide Preservative

helps give fir plywood *enduring* strength for heavy construction uses

Protein glues that laminate structural plywood are kept free of bacterial and fungus attack by addition of Dowicide 7 (Dow PENTAchlorophenol)



Glue-line-treated plywood had a high reuse factor (7-10 times) as concrete forms during construction of Seattle's Alaska Way viaduct.



Builders of modern Tacoma school economically used fir plywood sheets first as concrete forms, then as roof decking.

Once thought purely a decorative facing, fir plywood now competes successfully with other materials in the rugged, high-stress construction field. The great strength these plywood sheets acquire through lamination is protected by Dowicide® 7. This preservative (PENTAchlorophenol) effectively inhibits the growth and action of bacteria and fungi, which could destroy the glue line and cause the plies to separate.

Dowicide Preservatives serve as bactericides, fungicides and germicides in most of the businesses that come to your mind. Fourteen different Dowicides increase manufacturing efficiency or stabilize product quality for paint, textile, petroleum, pulp and paper, agricultural, transportation, leather, floor wax, cordage and many other concerns. *Your* processing, packaging or selling might well benefit through use of one or several Dowicide Preservatives . . . they're *all* marked by high stability, ease of handling and proved effectiveness.

Consultation with Dow's laboratories on individual preservative problems is immediately available. For detailed information, mail coupon to THE DOW CHEMICAL COMPANY, Midland, Michigan.

THE DOW CHEMICAL COMPANY
Dept. DP 655A, Midland, Michigan

Please send me further information on the uses of Dowicide Preservatives.

Name_____

Title_____

Company_____

Address_____

City_____ Zone_____ State_____

FIR PLYWOOD 1905 1955 GOLDEN JUBILEE

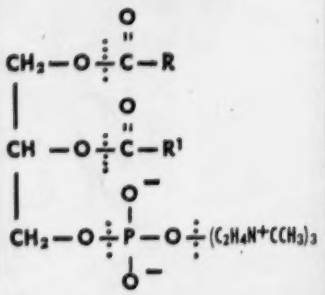
you can depend on DOW CHEMICALS

DOW

Staley's®

Products from Corn and Soybeans

...for Paints, for Baking... Vitamins and Candy Making...



LECITHIN

As an emulsifying or wetting agent for protective coatings, as an anti-oxidant in pharmaceuticals, bakery goods, and shortenings, as a penetrating agent in leather processing, Staley's Sta-Sol® Lecithin has become more and more important to industry. The unique properties of Lecithin that enable it to cause even dispersion of other compounds, liquids or solids, makes better end products for all the above industries.

Staley's Lecithin is obtained by an advanced refining method, with a resulting clear, always uniform and pure Lecithin concentrate, free of unwanted by-products. A Staley chemical representative will be glad to meet with you at your request, and furnish complete information on Staley's Lecithin.

For information about other quality Staley industrial products, Corn Steep Liquor, Corn Syrups, Amino Acids, Starches, etc., write:

A. E. STALEY MFG. CO.
DECATUR, ILLINOIS

DISTRIBUTION . . . . . .

For Tomorrow's Reference: Two new booklets – "Formulator's Manual of Herbicide Formulations" and Bulletin No. 45, "Alkyl Benzyl Triethyl Ammonium Chloride," both containing technical data and suggested applications. Emulsol Chemical Corp. (Chicago).

• Aluminum foil—47-p. booklet describes physical, chemical and surface characteristics, foil lacquers, adhesives and inks, and potential uses ranging from chemical and drug packaging to vapor barriers and insulation. Aluminum Co. of America (Pittsburgh, Pa.).

• Polyvinyl chloride, unplasticized—8-p. technical bulletin covers physical properties and summarizes resistivity of the material to various chemicals. No. 3B, Chemical Sales Division, Firestone Plastics Co. (Pottstown, Pa.).

• Steel shipping containers—31-p. booklet lists products and manufacturers of steel containers. Steel Shipping Container Institute, Inc. (New York).

• Nonoxidating rosin—8-p. bulletin



HANDIWORK: Nopco sales executives° hope to hike feed supplement sales.

Field Testing for Field Selling

Long useful in the laboratory, the experimental method occasionally finds an application in field selling. Confronted with the problem of pepping up poultry and swine feed supplement (vitamins, trace minerals, antibiotics) sales to farmers, the Nopco Chemical Co. decided to test the way before plunging into an all-out sales drive. Result: a sample sales-promotion campaign in the Pennsylvania, New Jersey, Delaware, Maryland and Virginia area. Its features:

• Articles for the rural press.

• A new sales manual for company salesmen.

• Advertising in poultry and feed journals.

• Promotional material for dealers including banners, mailers, and "mats" for reproducing ads.

• A guarantee to farmers that the supplement is of full potency when fed to livestock.

In selecting a method to stimulate sales, the company had several alternatives such as billboards, county fairs, journal ads and literature. A company spokeman averred the latter two seem to offer the best coverage per dollar and avoided methods favored by competitors.

Nopco reports good results from its campaign, now under way: although the general feed business is down 30% in the area, its sales are up almost 50%.

° L. to r.: R. J. Kingsley, R. Lastreto, T. V. Rankin.



Dimethyl Sulfoxide

A most unusual NEW Solvent...

Potential uses

- **Solvent for acetylene** ... absorbs 32% more acetylene than acetone ..... many times longer life in acetylene cylinders.
- **Selective separation of paraffinic** and aromatic hydrocarbon mixtures. Also for desulfurization of gasolines.
- **Solvent for certain synthetic fibres** such as polyacrylonitrile and acetate rayon as well as others.
- **As anti-freeze** or hydraulic fluid when mixed with water. (Offers possible cost savings.)
- **As paint and varnish remover.** Also nail polish remover.
- **Possibly useful as diesel fuel additive.** (Raises cetane number.)

Write For Complete Information

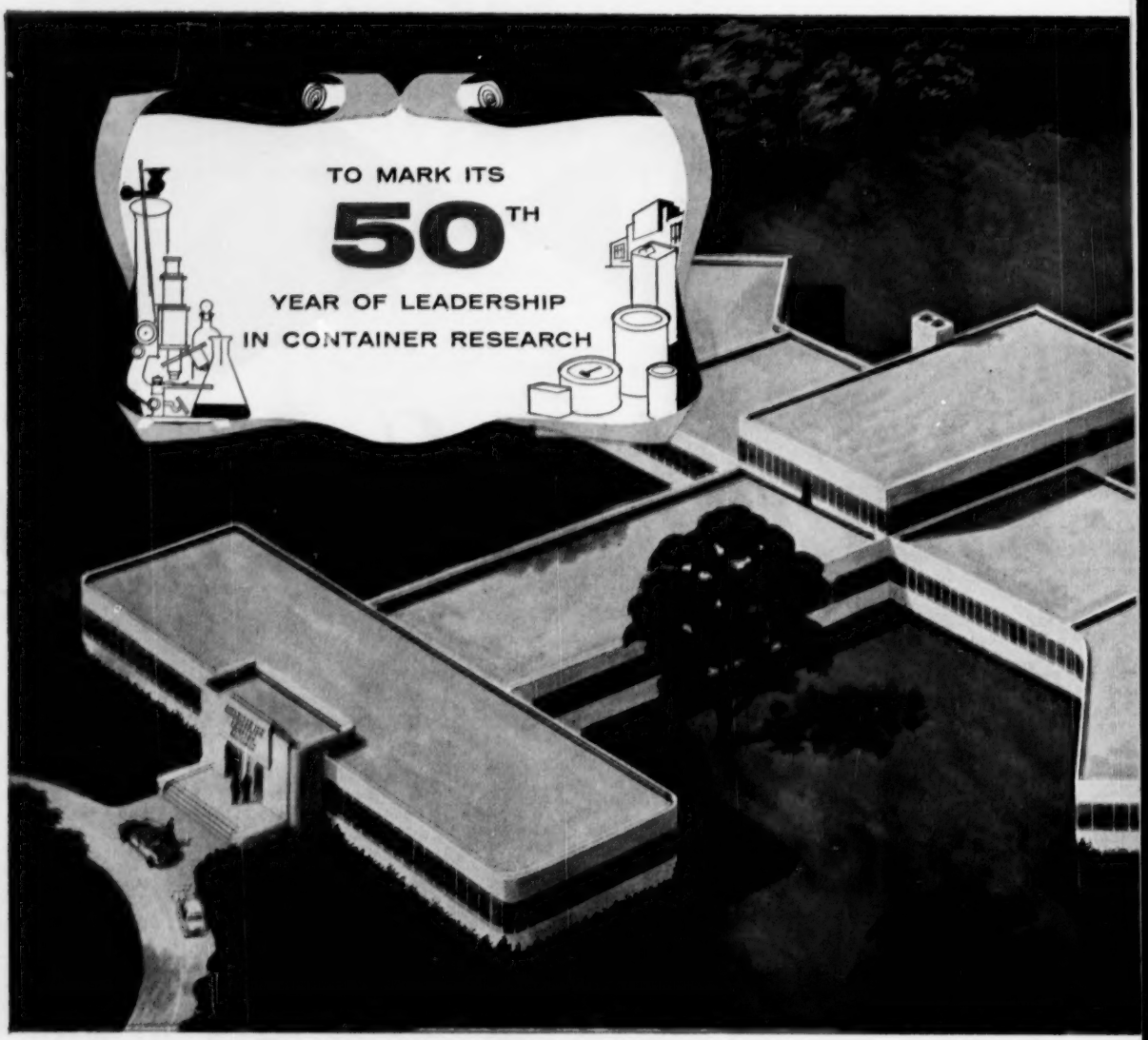
Physical Properties

Dimethyl Sulfoxide

Molecular weight	78				
Melting point	18.45°C (supercools easily)				
Boiling point (760 mm)	189°C				
Spec. gravity (20°C)	1.100				
Refractive index ($n21°_D$)	1.4787				
Vapor pressure	at	20°	30°	47.4°	56.6°C
	mm	.37	.79	2.82	5.11
Viscosity 27°C	1.1 cps				
Specific heat	.5 cal/g as solid .7 cal/g as liquid				
Heat of vaporization	ca 175 cal/g				
Heat of solution	60 cal/g				
Heat of fusion	20 cal/g				
Heat of combustion	6050 cal/g				
Flash point (°C)	95° (open cup)				
Coefficient of expansion	.00088				
Dielectric constant	45				

STEPAN CHEMICAL COMPANY
20 North Wacker Drive, Chicago 6, Illinois
Telephone: CEntral 6-5511

FATTY ALCOHOL SULFATES • BULK LIQUID DETERGENTS • SULFONATED OILS • AMIDES • FOAM STABILIZERS • ALKYLPHENOL POLYALKOXY SULFATES



American Can Company opens the most modern

Dedicated to creating cans that will add new convenience to your products

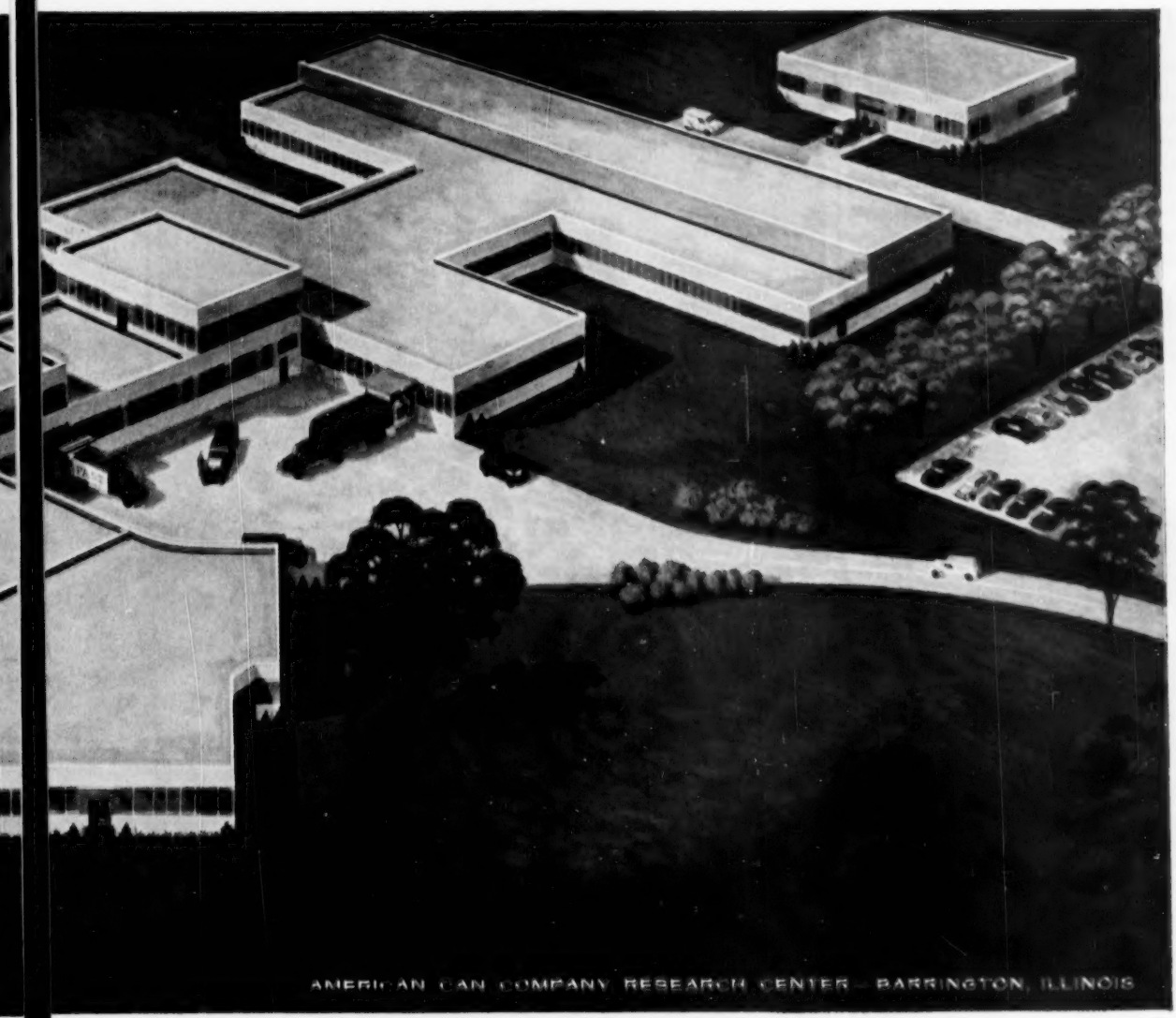
This new research center is the latest link in the chain of progress which began with Canco's container research laboratory—the first in America—which was opened in 1906.

Through Canco research have come such important developments as the doubletite paint can, the motor oil can, the non-drip liquid detergent can, and new packages for drugs, medicinals, insecticides, blood plasma, and a host of other products.

The shape of cans to come

Who can even venture to guess what new miracles will be born at Barrington? For here, Canco's creative scientists will have the finest equipment and the most up-to-the-minute facilities of any container laboratory in the world.

Many dreams are already taking shape under our new roof. Studies are progressing in the use of atomic energy in the "cold sterilization" of foods.



AMERICAN CAN COMPANY RESEARCH CENTER – BARRINGTON, ILLINOIS

research center in the can-making industry

Accomplishing the "impossible"

Even more dramatic is the search for ways to make tin cans *without tin* . . . America's major source of tin lies directly in the path of current aggressors.

The problems are staggering—but the results will be even more so. We call this vitally important program *Operation Survival*—a name which may one day mean exactly what it says.

"Good" isn't good enough

Experience has taught that no container manufacturer can hope to make significant contributions to the nation's economy without constant research advancement. The good ways are not necessarily good enough. The formula for growth is constant change, constant improvement, constant search for new and better containers.

It is to this kind of change that Canco's new Barrington Research Center is dedicated—to provide still better packaging for the products of America's agriculture and industry.

Go First to the People Who Are First!

AMERICAN CAN COMPANY

CANCO

New York, Chicago, San Francisco

provides technical data on stabilized rosin and recommends various applications. National Rosin Oil Products (New York).

• Drum cleaner—Literature offers information on steel-drum cleaning with airless abrasive blast. American Wheelabrator & Equipment Corp. (Mishawaka, Ind.).

• Chemical Industry Facts Book—160-p. second edition, includes material on products, companies, professional societies and trade associations. Price: $1. Manufacturing Chemists' Assn. (Washington, D.C.).

• Peroxide bleaching of Southern pulps—Technical leaflet presents data on chemicals, equipment and techniques of Southern-pulp bleaching. Becco Chemical Division, Food Machinery and Chemical Corp. (Buffalo, N.Y.).

• Two brochures, "Propylene Glycol" and "Carbitol Acetate." Physical and chemical properties, specifications, shipping containers, and suggested uses are included in both booklets. Carbide and Carbon Chemicals Co. (New York).

• Molding compounds—Wall chart tabulates physical and fabrication data, lists various styrene molding compounds and suggested areas of application. Monsanto Chemical Co. (Springfield, Mass.).

• Cylinder tests—Pamphlet describes ways of measuring gas cylinder service life. No. C-5, Compressed Gas Assn. (New York).

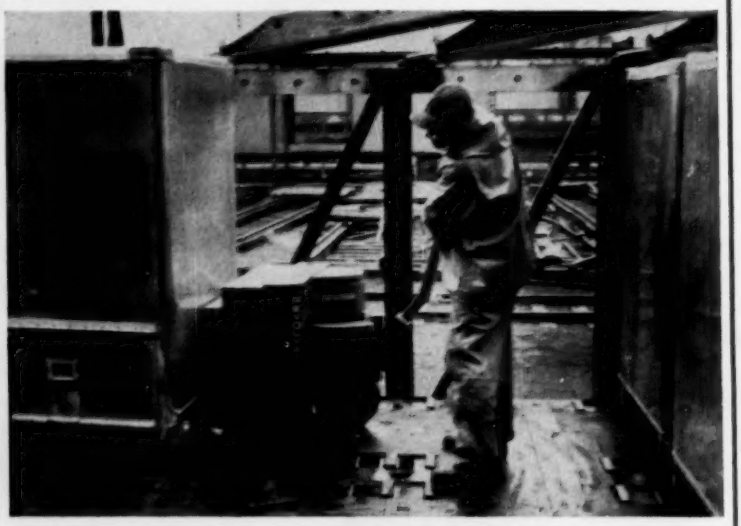
• Alkali chemical primer—"Story of the Chemicals You Live By" presents in nontechnical language principal company products and their end uses. Diamond Alkali Co. (Cleveland).

• Vinyl chloride copolymer—Leaflet furnishes physical and formulating characteristics. Chemical Sales Division, Firestone Plastics Co. (Pottstown, Pa.).

• Fine-chemical catalog—Contains general information, packaging data, and lists over 1,000 Baker and Adamson reagent and fine chemicals. General Chemical Division, Allied Chemical & Dye Corp.(New York).

• Oleic acids—20-p. brochure provides information on evaluation methods, end-use recommendations, shipping and handling, and acid technology. Emery Industries, Inc., Dept. 5, Carew Tower, Cincinnati.

• Calcium chloride—18-p. brochure contains information on the handling



Fitting the Car to the Box

HARDLY A WEEK goes by any more without someone offering the chemical industry a new container or handling device. This week, no exception, brings a specially designed railroad car for an old container. Above: a fork-truck operator positions a Tote System aluminum box (*CW, Jan. 16, '54, p. 82*) on the car. Below: fully loaded, the new car will hold 28 separate containers, can carry a 100,000-lb. load of powders.

Sides and overhead bars lock containers into place. The boxes may be charged or discharged through openings in the bottom and the top, without removing from the car. Container capacity: 74 cu. ft. in 42x48x69 in.

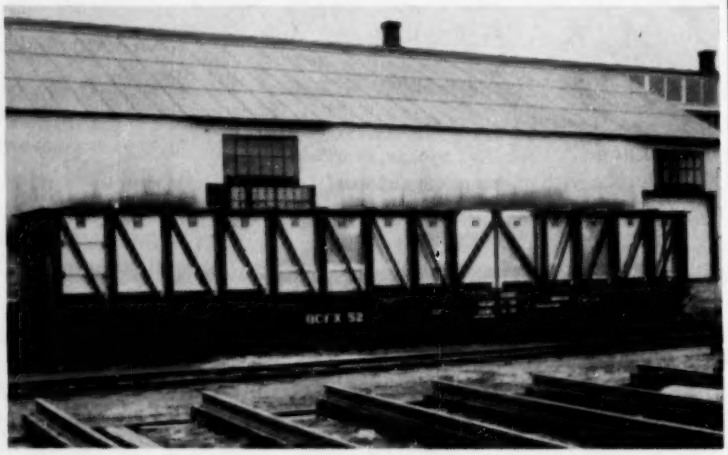
Use of the car, claim its manufacturers, proffers several advantages:

• One man, with equipment, can load or unload the car in less than one hour. This reduces loading labor costs.

• Watertight, the containers avoid losses through contamination, deterioration and wetting.

• No space-weight freight charges are made for the boxes, whether full or empty.

Angling for chemical, flour, and other industries with granular materials, Shippers Car Line expects to have 1,500 such cars in operation within five years.

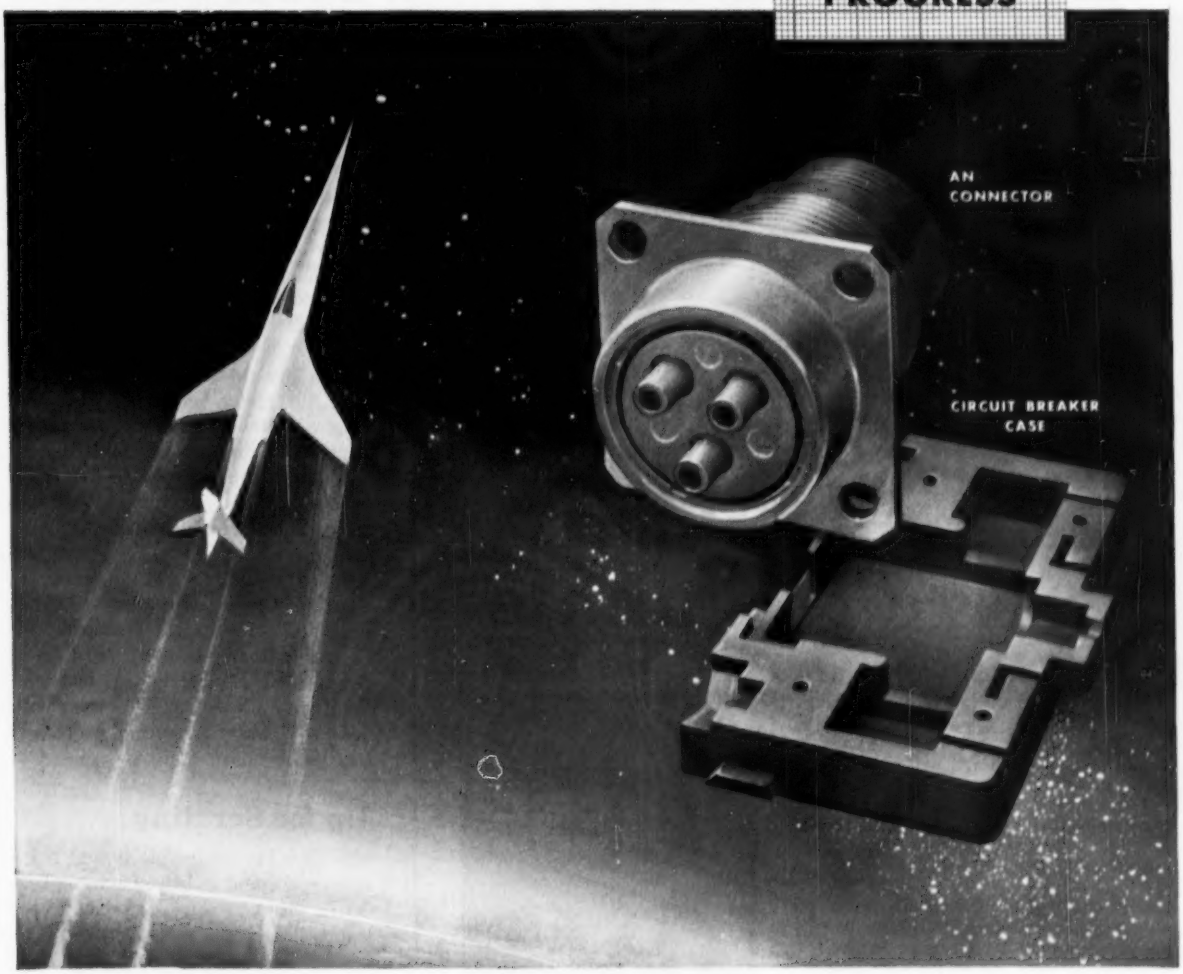


Q. *Could chemical research create electrical insulation to keep pace with the ever-increasing demands of hotter-flying jets?*

A. **INSULATION THAT LETS 'EM FLY HIGHER, FASTER, HOTTER!**

Another example of

CHEMICAL PROGRESS



Today's supersonic jets are flying higher, faster—and *hotter!* When conventional insulation failed to meet the new critical temperatures and higher voltages, General Electric chemical engineers applied G-E mycalex—a blend of mica and a special glass.

G-E mycalex "nests" now surround AN connectors of the jet's pulsing electrical circuit . . . withstanding super-hot flames for *twenty crucial minutes or longer.* G-E mycalex circuit breakers now provide resistance against the destructive power of flashing arcs.

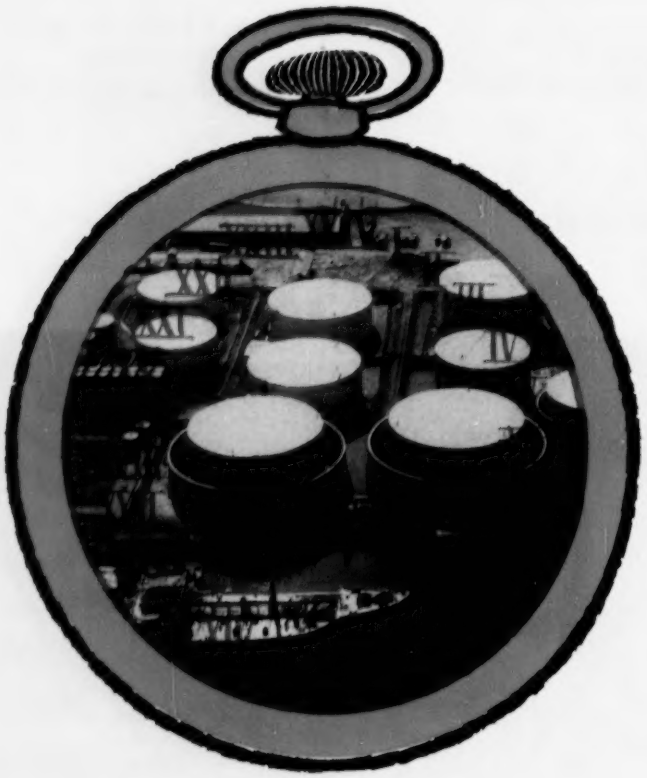
So jets fly hotter—yet more safely—thanks to G-E mycalex. It's one more instance of progress for all—through G-E *chemical* progress.

★ ★ ★

For new developments in Plastics Compounds, Silicones, Electrical Insulating Materials, Industrial Resins and Varnishes, Plastics Laminating and Molding . . . write for "G-E Chemical Products" booklet (CDG-101) to: *CHEMICAL and METALLURGICAL DIVISION, General Electric Company, Section 1500-2B, Pittsfield, Mass.*

Progress Is Our Most Important Product

GENERAL ELECTRIC



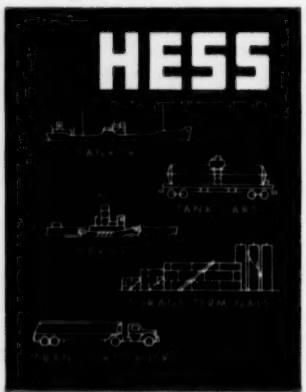
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of bulk calcium chloride, including facts on unloading, spreading, equipment and solution of the dry material. Dow Chemical Co. (Midland, Mich.).

•

Flexible Packaging Survey: The Dept. of Commerce has initiated a survey to determine statistics for converted flexible packaging products. Results summaries will be published monthly and be available from the Industry Division, Bureau of Census, Washington 25, D.C.

•

Expendable Pallets: Taring only 6¼ lbs. and able to support better than a 6-ton load, a new cardboard pallet measuring (unassembled) 32x40x7/16 in. is available from American Products Industrial Co. (New York). Transport and storage savings are claimed.

•

Match for Matchbooks: Again this year, the Match Industry Information Bureau (New York) will sponsor a contest for the best chemical matchbook from the view of selling copy, art work, and typography. Entry forms, available from the bureau, must be received by Sept. 1.

•

Cans For Chemicals: Two new sources of supply of cans for chemicals are becoming available. Geo. D. Ellis & Sons, Inc. (Philadelphia) and the Southern Can Co. (Birmingham, Ala.) will both offer special containers for the chemical industry.

Up for Scrutiny

Making a bid for the plasticizer, polyester resin, and polyurethane markets in the years to come, isosebacic acid leaped into prominence this week. The reason: the announcement by U.S. Industrial Chemicals Co., Division of National Distillers Products Corp., that pilot-plant production is now under way, that construction of a full-scale plant will soon begin.

Currently, better than 125 companies are evaluating USI's product, which is comprised of 72-80% alpha-ethyl suberic acid, 12-18% alpha-alpha′ diethyladipic acid, and 6-10% sebacic acid. Besides plastics use, the company expects applications to develop in ester lubricants, alkyd resins, polyamids, and various chemical syntheses.

(Advertisement)

CHEMICALS OUTLOOK

June, 1955

This news bulletin about Wyandotte Chemicals services, products, and their applications, is published to help keep you posted. Perhaps you will want to route these and subsequent facts to interested members of your organization. Additional information and trial quantities of Wyandotte products are available upon request . . . may we serve you?

SAMPLES AVAILABLE OF NEW PIPERAZINES AND PYRAZINES

Recently, we announced the development of methods for the commercial manufacture of important piperazines and pyrazines--specifically 2-methylpiperazine; cis-2,5-dimethylpiperazine; trans-2,5-dimethylpiperazine; mixed cis-trans-2,5-dimethylpiperazine; 2-methylpyrazine; 2,5-dimethylpyrazine. Now we are happy to state that samples of these products are available upon request.

SOME SUGGESTED USES FOR PIPERAZINES AND PYRAZINES

For polymers: Vinylpyrazine can be prepared from 2-methylpyrazine and formaldehyde and can be polymerized in the same manner as 2-vinylpyridine . . . polyamides are formed by reacting piperazines with various dicarboxylic acids.

For pharmaceuticals: Antiviral activity is reported for sulfa drugs derived from pyrazine while pyrazine carboxylic acids have antipellagric activity and can be prepared from the corresponding methylpyrazines by oxidation . . . antihistaminic activity is reported for the 1,4-di-substituted piperazines . . . piperazine derivatives, especially the salts of organic acids, are particularly effective as anthelmintics.

Pyrazine and its homologues have, to date, found use almost wholly in the pharmaceutical field. However, due to similarities in structure and reactions, the pyrazines will probably find applications in fields where the pyridines are presently used.

Piperazines, aside from use in pharmaceuticals and for forming polymers, have potential applications in: surface-active agents, stabilizing agents, agricultural chemicals, rubber chemicals, catalysts, solvents,

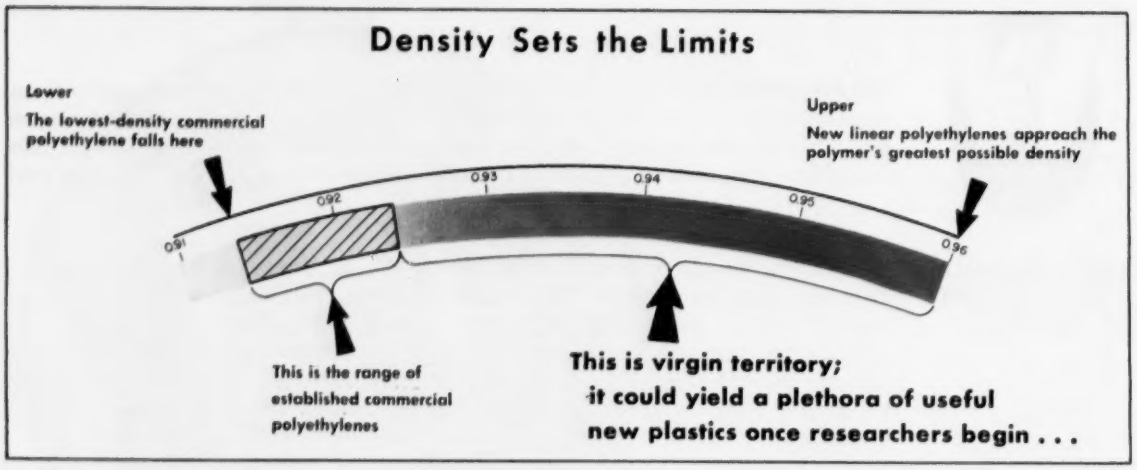
SEND FOR HELPFUL LITERATURE SURVEY

To aid you in your research, we've compiled a 33-page booklet containing excerpts from chemical literature. These excerpts relate to the reactions and applications of piperazines and pyrazines and their derivatives. Copies of this survey are available without charge . . . simply write us on your company letterhead.

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Filling in the Polyethylene Spectrum

Du Pont will build a pilot plant on the Sabine River at Orange, Tex., to produce evaluation quantities of the so-called linear polyethylenes.

Like the new polyethylenes of Carbide and Koppers, the Du Pont product will be a Ziegler-type plastic; it spotlights the sharp impact of these materials on polyethylene research.

Still simmering from the heat of recent developments, the polyethylene pot was again brought to a boil this week—this time by Du Pont. The company revealed plans for a pilot plant at Orange, Tex., to produce polyethylene via the low-pressure process pioneered by Karl Ziegler. Du Pont is licensed by Ziegler, expects to be turning out limited quantities of the high-density product by fall.

This news has triple significance:

- It lends added weight to the chorus of companies—Carbide, Koppers and Phillips, in addition to Du Pont—that are voicing a proprietary interest in new high-density, linear* polyethylenes.
- It raises anew the key question of how the Phillips process and product differs (if at all) from Ziegler's.
- And it delineates the area in which researchers will be seeking polyethylenes of the future.

Close Packed: As a group, the low-pressure products of Carbide, Koppers and Phillips are distinguished by higher densities, softening temperatures, tensile strengths and molecular weights than those of the more familiar commercial polyethylenes. Their principal outward feature is a marked degree of rigidity.

Phillips' new Marlex 50, for example, possesses a density of 0.96, softening temperature of 260 F and tensile strength (depending on molding conditions) ranging from about 3,500-5,100 psi. Its molecular weight has not been revealed, but a recent Belgian patent issued to Phillips (*CW, May 14, p. 101*) details low-pressure polyethylenes having average molecular weights 5,000 to 30,000.

Koppers' Super Dylan, a Ziegler-process material, has these specifications: density, 0.93-0.95; softening temperature, above 250 F; tensile strength, 2,800-5,500 psi. Molecular weight is reported to be in the vicinity of 50,000.

Today Phillips and Ziegler processes are the only methods receiving serious study by producers and potential producers of high-density polyethylenes. Only Phillips is known to be actively involved with its own method, although the company has stated its willingness to license others who decide they want to use the process. Phillips, meanwhile, is planning a 100-million-lbs./year plant.

The Ziegler process, on the other hand, is already ensconced in a Carbide pilot unit at S. Charleston, W. Va., and in Koppers' Port Arthur, Tex., plant. Aside from Carbide, Koppers and Du Pont, others known to have an interest in the Ziegler method are Dow and Goodrich-Gulf. Hercules and Monsanto, too, are said to possess rights to the process, but both refuse to confirm or deny these reports.

Both processes have at least one thing in common: low pressure. Although Phillips has not disclosed any details of its method, the previously mentioned patent calls for pressures of at least 100-300 psi. and preferably about 500 psi. Ziegler, in U.S. patent 2,699,457 (granted Jan. 11 of this year), specifies pressures up to 2,000 atmospheres.

But, he asserts: "It is possible . . . to operate at pressures below 100 atmospheres and even . . . down to 10 atmospheres, only . . . the process will take a correspondingly longer period of time."

Products of both methods are analogous in their chief structural features. They are characterized by long polymer chains punctuated only infrequently by the short-chain branches that abound in conventional polyethylenes. This largely explains the high densities observed: relatively free of

* So called because of their linear, comparatively unbranched structure.

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obstructing branches, the linear molecules pack themselves into a tight bundle that might be likened to a roll of pencils held together by a rubber band. This also accounts for the highly crystalline nature of these polymers.

Except for pigmented samples, nearly all Ziegler polyethylene seen thus far has been slightly off color. This might possibly be tied to the material's molecular structure, although the process is generally believed to conceal a more likely culprit. In any case, there is optimism that this drawback can be eliminated.

Setting the Course: The new dense polymers do more than bulk out an already-sizable agglomeration of commercially available polyethylenes (*see table, below*); they effectively set the upper density limit* for polyethylenes, thereby define the probable future course of research in this field.

Between densities of 0.923 (highest of the conventional polyethylenes) and 0.96 or 0.97 (upper range of the linear materials), there lies a broad

* These linear materials, with their scarcity of short-chain branches, approach the polyethylene of theoretical maximum density. This would be the perfectly linear polyethylene, completely devoid of short-chain branches.

POLYETHYLENE UPDATE

What's Available in Polyethylenes

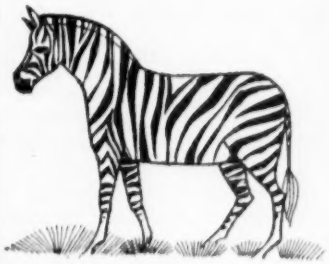
Company	Product	Density	Softening pt. F (vicat)	Melt Index	Tensile Strength (at yield pt.) psi
Bakelite	DYLT	0.92	below 235	200	1050
div. Union	DYNI	0.92	235	1.5 —1.0	
Carbide	DYNF	0.92	235	3.6 —2.5	1450
	DYNH	0.92	235	2.4 —1.5	1450
	DYNJ	0.92	235	0.99—0.41	1500
	DYNK	0.92	235	0.40—0.19	1600
	DYGT	0.92	below 235		
Du Pont	Alathon 3	0.923	208	0.3	1600
	Alathon 10	0.923	201	2.1	1700
	Alathon 12	0.919	189	2.1	1500
	Alathon 14	0.914	176	1.8	1320
	Alathon 16	0.923	200	4.0	1600
	Alathon 20	0.920	191	2.1	1450
	Alathon 22	0.919	189	3.0	1450
	Alathon 25		201	1.2	1650
Eastman	Epolene E wax	0.935			
	Epolene N wax	0.925			
	Tenite 800	0.922		1.4—2.0	1300
	Tenite 807	0.921		6.0—8.0	1200
	Tenite 808	0.920		2.0—3.0	1200
Koppers	Super Dylans	0.93—0.95	above 250	0.1—4.0	2800—5500
Monsanto	Orizon 805	0.916	221—230	2.0—3.5	1150
	Orizon 705	0.916	221—230	1.0—2.0	1150
Phillips	Marlex 50	0.96	260	0.6	
Spencer	1005	0.915—0.92	196	2.0	1490
	1007	0.915—0.92		8.0	
U.S.I.	Petrothene 100			2.5	
	Petrothene 200	0.922	about 200	close to 2.5	
Semet-Solvay	AC 6 wax	0.92	207—216†		
div. Allied	AC 7 wax	0.92	216—223		
Chemical	AC 615 wax	0.92	216—219		
	AC 617 wax	0.92	190—194		
	AC 629, —30, —31††	0.93	205—208		

† Fisher-Johns M.P.
†† All three are emulsifiable; they differ in viscosity, color and penetration.

Capsule Case History:



From A to Z...



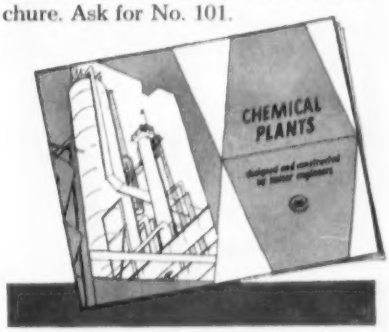
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expanse of fertile territory (*see chart, p. 58*) for polyethylene plastics probers (Koppers' new entries are the only resins in this range). Here are to be found the polymers of intermediate density, flexibility and strength. They are the materials needed to fill the gaps in the potentially broad spectrum of properties obtainable in polyethylene.

The reward for this pioneering effort is largely conjectural. Experience with the plastic has demonstrated that relatively small changes in certain properties (e.g., flexibility) can be the difference between success and failure in a likely application. The feeling among companies in the field is that middle-density-range polymers will open many new and still unenvisioned uses for polyethylene.

How to get these unfamiliar representatives is also worth pondering. Fortunately there is a master pattern linking polyethylene's structural features to physical and chemical properties. Put together by an assiduous team of Du Pont researchers (*CW, Feb. 6, '54, p. 44*), this correlation may be used to design a polymer of desired properties. The trick, of course, is to design a feasible plant-scale process to give the planned result.

Research under way in the laboratories of polyethylene makers reflects the growing awareness of the middle-density range. High-density materials are under scrutiny by Phillips and the Ziegler licensees, as well as firms (e.g., Spencer, U.S. Industrial Chemicals) that do not now have rights to existing low-pressure processes. Hercules, incidentally, admits a great deal of interest in the new polyethylenes, reveals that it is researching them.

Straw in the wind: Semet-Solvay (division of Allied Chemical), which now produces polyethylene only as waxes, is investigating other forms of the material.

No Competition: A fair question at this point might be: Why all the effort going into the development of new polyethylenes, when there is now a marked overcapacity for available polyethylenes? Surplus capacity this year is pegged by some at over 250 million lbs.*

Part of the answer is to be found in the bullish attitude of the industry, which expects the surfeit capacity to be taken up within three years.

But where the new linear materials are concerned there's an entirely different explanation. They represent, states one polyethylene maker, almost a separate family of plastics that will not be primary competition for conventional polyethylenes (upon which present capacity is based). Lacking the great flexibility that has become the hallmark of polyethylene, the dense materials are more likely competition for plastics such as impact styrene.

Cost of the dense materials, expected to be in the range (possibly somewhat less) than that of conventional polyethylenes, does not preclude this kind of speculation.

Applications envisioned for the linear polyethylenes: toys, kitchen ware, battery cases, radio housings, steering wheels, refrigerator parts, washing machine agitators, etc. Also included are such traditional polyethylene uses as packaging films, bottles and carboys, pipe and fittings.

But where packaging films are concerned, at any rate, there's skepticism about the commercial prospects for high-density polyethylenes. Doubters maintain that films of the new resins will be inferior to those made of ordinary polyethylene. And samples of film made of the new material tends to support this contention.

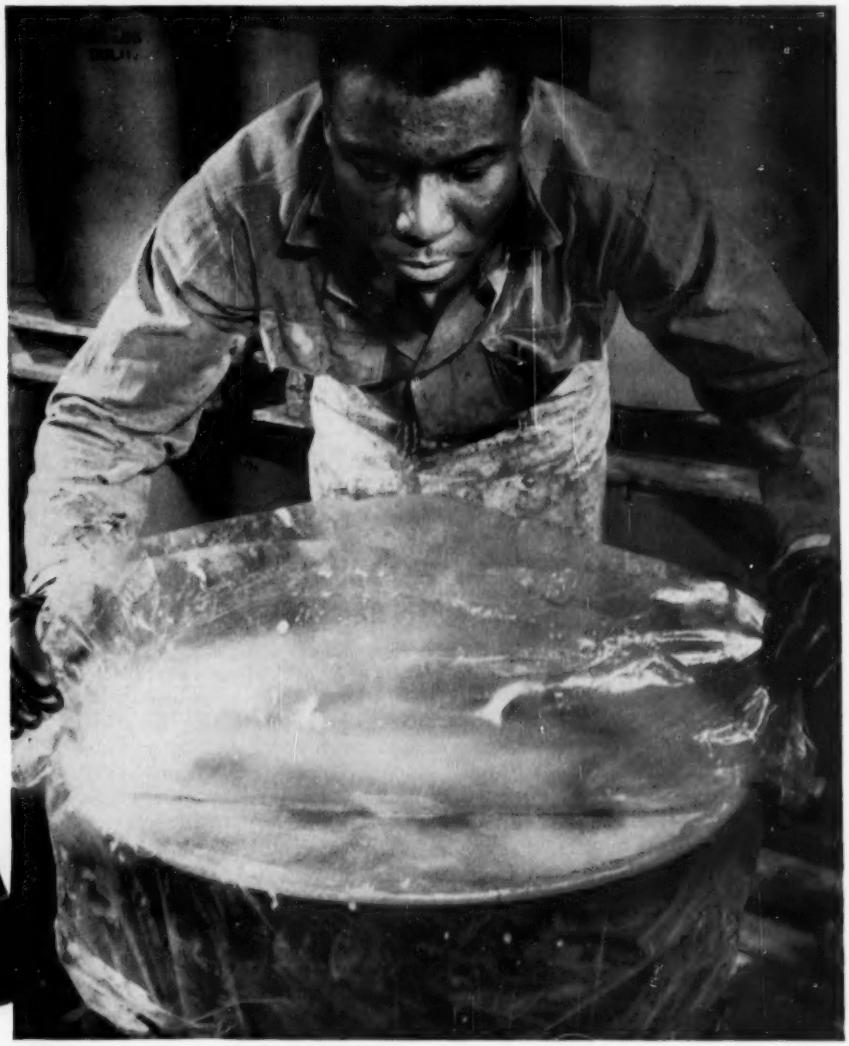
Right now, much of the speculation about uses is wishful thinking. Solid commercial applications are not ready and waiting for the new materials; they must be developed. Producers, of course, will be doing application research. But there is widespread feeling in the industry that once the dense polyethylenes begin to appear in force, potential customers will be suggesting plenty of uses.

This attitude stems from experience. A check of polyethylene makers reveals that promising ideas spring from a variety of unforeseen sources. A complete surprise, for example, was the brainchild of a resourceful agriculturist: he suggested the possibility of lining irrigation ditches with polyethylene, to reduce wasteful seepage of water into the ground.

Mindful that the idea of making polyethylene bottles came from the outside, a producer of the plastic hopefully points out that just one unforeseen windfall could send the new plastics rocketing.

* Total polyethylene capacity is put at 571 million lbs./year and production for 1955 is estimated at about 300 million lbs.

SAVINGS SHOW it pays to package in film made of BAKELITE Polyethylene



With a double liner of polyethylene film, this drum is filled with phosphoric acid. A pre-cut circle of polyethylene film is then placed over the top of the drum before clamping on the metal lid. Sealed drums can be handled by any conventional means. **Flexible Package Company,** Chicago, Ill., made these liners from Visqueen film made by **The Visking Corporation,** Terre Haute, Ind.



"for a fraction of the cost . . . identical results"

That's the report of Time Chemical, Inc., Chicago, Ill., after two years' experience with drum liners made of film produced from BAKELITE Brand Polyethylene.

"With a fast growing business," states Irving Bell, partner, "we were faced with a cost and inventory headache in barrel shipments of acids and detergents. Our shift to polyethylene liners in conventional iron drums proved to be the answer. It is inexpensive, lightweight, foolproof insofar as the holding quality is concerned, and has saved us up to $10,000 in inventory necessary in previous methods. *For a fraction of the cost, we are getting identical results.* Moreover, where hygroscopic materials suffered from moisture contamination previously, we have been able to eliminate this hazard altogether by the use of polyethylene liners."

Drum liners, bottles, carboys, pipe and tubing, phials, and sealed envelopes all benefit by the inertness of polyethylene to a great majority of chemicals. It can pay you well to discuss packaging and materials handling in film made of BAKELITE Polyethylene. Call your packaging supplier.

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PFIZER TEAM*: Their anesthetic search turned up a . . .

Sleeper in the Steroids

In the select circle of anesthetics, new members are a rarity; the oldest anesthetics are still the most widely used. This week, however, a new synthetic —21-hydroxy-pregnanedione sodium succinate—is making its bid for entry on the basis of early clinical successes and an unusual combination of properties.

Developed by Chas. Pfizer & Co., Inc. (Brooklyn), the agent is a supplementary anesthetic.

Alone, it produces only mild anesthesia. But in combination with nitrous oxide, it is said to be a deep-sleep inducer, providing freedom from nausea, headaches, and other common inhalant aftereffects.

The find spotlights a branch of drug research distinguished by its complexity. The ideal anesthetic must be highly active, have a wide margin of safety, be nonirritating to the patient, and possess no side effects. It should be capable of rapid and easy induction and permit discomfort-free recovery. At the same time, it ought to bring about muscular relaxation and be completely controllable. Since the ideal has not been attained, combinations of anesthetics are required for optimum results.

Ether (alone or in combination with nitrous oxide) is still the agent of choice in a large number of the approximately 5 million surgical anesthesias administered each year (nearly half of these are by inhalation). Ether accounts for about $1.5 million of the anesthetic market.† And its principal supplier, Squibb & Sons (division of Olin Mathieson) reports steady sales during the past few years.

Other inhalants include ethylene, cyclopropane divinyl ether, and trichloroethylene. Chloroform is used mainly in the tropics, where its high boiling point makes it easier to handle than ether.

Intravenous anesthetics, which include the new Pfizer product, are becoming increasingly popular, now are administered in more than a quarter of all cases. Of these materials, thiopental sodium—pioneered by Abbott Laboratories (N. Chicago) in 1935—leads in usage.

Tradenamed Viadril, the Pfizer synthetic has been evaluated in 130 operations at the University of California (San Francisco) school of medicine. According to the company, additional clinical tests are now under way in a large number of hospitals across the country.

One of the results of this work is the discovery that the new agent is able to substitute for curare (used as a muscle relaxant) in a number of cases, may lessen the need for the latter as an anesthesia aid.

Pfizer's Gerald Laubach who, with associates S. Y. P'An and Harry Rudel, screened out Viadril from more than 100 steroid compounds, got his cue from the work of Canadian scientist Hans Selye. In 1941, Selye noted the sedative effect of certain steroids injected into rats.

Pfizer isn't neglecting the possibility that other steroid compounds will be found that will exhibit even more useful anesthetic properties. The new drug and related compounds, incidentally, are covered by U.S. Pat. 2,708,651, assigned to the firm this month.

Most pharmaceutical firms researching anesthetics doubtless will be investigating steroids. Today, however, these companies are concentrating on modifications of conventional anesthetics.

Winthrop-Stearns, for example, is appraising a new Novocainelike compound, isn't ready to release its findings. The firm's last contribution was its Ravocaine (2-diethylaminoethyl 4-amino-2-propoxybenzoate), a local anesthetic introduced in 1953.

Abbott is still actively probing barbiturates, but has nothing new to debut.

In view of the fact that ether was introduced in 1842, nitrous oxide in 1844, and chloroform in 1847, it appears that new anesthetics needn't fear rapid obsolescence. If they prove out, steroid sleep-inducers should be around for a long time to come.

Expansion Harvest

The current round of research-laboratory expansion produced the following:

- At Esso Research Center (Linden, N.J.), Enjay Co. recently dedicated its new petrochemicals laboratory, simultaneously revealed Esso's plans to build additional facilities for butyl rubber research. A feature of the new lab: electricity, instead of gas, for heating purposes.
- Planned for construction this summer, Consolidated Engineering Corp.'s (Pasadena, Calif.) $1.5-million building is slated to house the firm's research, engineering and marketing divisions. A 120,000-sq.-ft., two-story concrete structure, it will be built on an 8-acre site adjoining CEC's main plant. Included in the project is parking space for 85 cars in the base-

* Left to right: Harry Rudel, S.Y. P'An, Gerald Laubach.

† Estimated at nearly $9 million, of which general anesthetics account for over $6 million ($4 million for the injectible variety). About $2.8-million worth of topical and local anesthetics is sold each year.



Announcing the 1955 Glycerine Research Awards

FIRST AWARD	**Honor Plaque**	**$1,000**
SECOND AWARD	**Honor Certificate**	**$300**
THIRD AWARD	**Honor Certificate**	**$200**

The purpose of this group of awards, established in 1952 by the Glycerine Producers' Association, is to recognize and encourage research leading to new and improved applications of glycerine or glycerine derivatives to products or processes. The work may concern itself with the chemical, physical or physiological properties of glycerine, or with properties of glycerine-containing or glycerine-derived materials. It may deal with applications which of themselves are currently or potentially of value to industry or the general public, or it may deal with scientific principles or procedures likely to stimulate future application. Originality in extending the application of glycerine into new fields of usefulness will receive special consideration for awards.

BASIS OF ENTRY

These awards are open to any individual in the United States and Canada engaged in research, whether employed in industry or affiliated with a governmental or educational institution (faculty or college student) except those connected with member companies of the Glycerine Division, Association of American Soap & Glycerine Producers, Inc., or laboratories which they employ. (Joint entries by research teams or associates of two or three individuals are also eligible.)

PERIOD OF AWARD

First consideration for the 1955 Award will be given to work which has come to a successful conclusion or clear-cut point of accomplishment during the current year, regardless of the date at which the work was initiated. Work carried on in previous years, but the significance of which has been confirmed by commercial application in 1955, will be eligible.

JUDGES

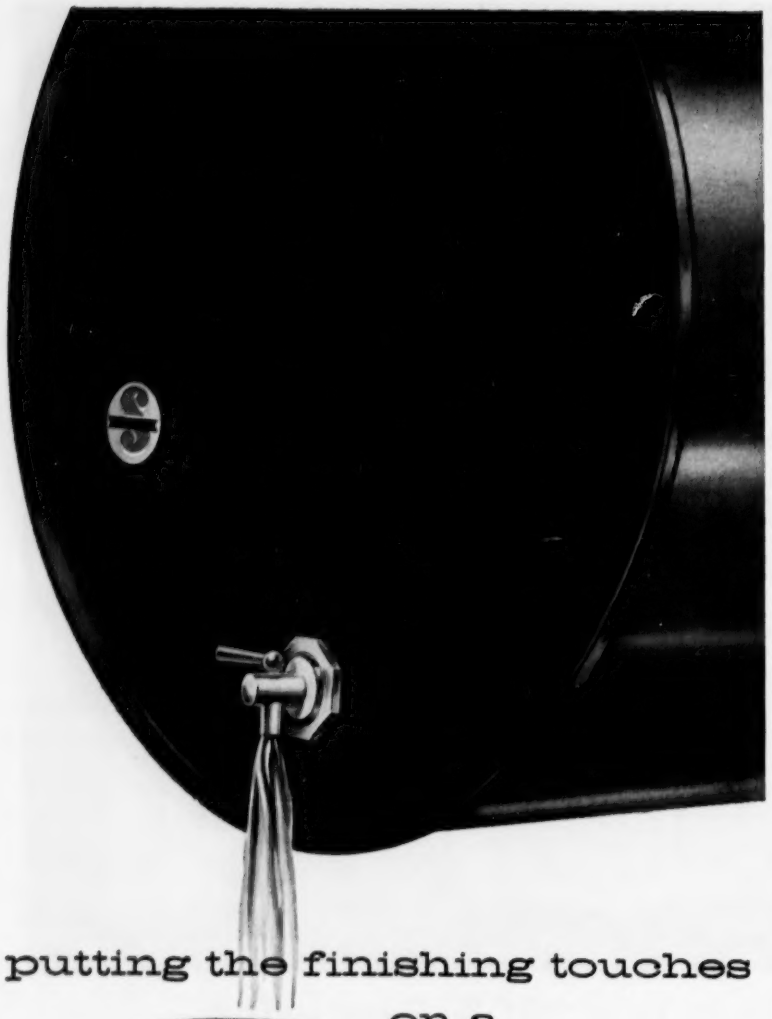
Selection of award winners will be made by a committee of three judges of outstanding reputation and appropriate scientific background, having no connection with the Association or its members.

DATE FOR NOMINATIONS

All nominations for the 1955 awards must be received by *November 1, 1955.*

METHOD OF NOMINATION

Only nominations made on the official entry blank will be eligible for awards. For a copy of this official entry blank, write to: *Awards Committee, Glycerine Producers' Association, 295 Madison Avenue, New York 17, N. Y.*



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RESEARCH . . . . . .

ment and a garden-type patio on the top floor.

• Koppers Co. has revealed plans for a coal-hydrogenation pilot plant at its research center in Verona, Pa. The move caps five years of experimentation in coal gasification at Verona. Research director E. W. Volkmann will head the new project.

• In Coventry, England, Courtaulds Ltd. has just completed its big new viscose research laboratory. Built in 18 months at a cost of $11.2 million, the facility includes a 20-ton/week rayon staple pilot plant and a continuous spinning machine that produces up to 15,000 lbs./week of experimental high-tenacity industrial yarns. It is the largest of Courtaulds' six laboratories.

• Also in England, British Rayon Research Assn. has opened its new $1.4-million laboratories (Manchester) for studies of all the man-made fibers.

•

Foreign Assignment: Newest technical emissary to Europe (*CW, May 14, p. 48*) is Union Carbide's Roland Voorhees. He will be mainly concerned with new syntheses and production processes. Voorhees previously supervised engineering for Carbide's new Texas City, Tex., Oxo plant.

•

Diamond Makers: Vitron Research Corp. (Spring Valley, N.Y.) has reportedly synthesized industrial grade diamonds ranging in size from 0.01 to 0.003 carats. Vitron researchers Leondro Tomarkin and Mario Vilella used a redesigned 300-ton hydraulic press, pressures of 250,000 psi., and temperatures up to 6,000 F.

•

Newly Tagged: Cetyl-1-C-14 alcohol and stearyl-1-C-14 alcohol are newly available from Nuclear Instrument and Chemical Corp. (Chicago). Expected to find use in detergent and metabolic studies, the compounds cost $450/millicurie (under Atomic Energy Commission licensing procedures), are obtainable in 1, 0.5, and 0.1 millicurie package sizes.

•

Strand Burner: For use in solid propellant research, Atlantic Research Corp. (Alexandria, Va.) is making available a complete strand-burning assembly comprising a burning-rate bomb, timing and control unit, conditioning bath, and control panel. De-

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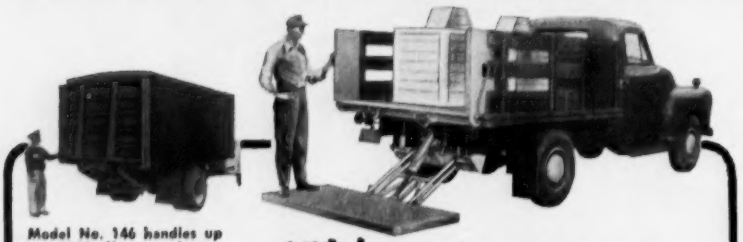
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signed to operate with small propellant samples (approximately ⅛-in. square and 6 in. long), the apparatus reputedly requires only installation to be ready for use. Price: $4,500 for the complete assembly (Model No. 200); $700 for the bomb portion (Model SBR-210).

•

Titanium Studies: Two new reports, obtainable from the Office of Technical Services, U.S. Dept. of Commerce, (Washington) deal with problems in titanium utilization. They are PB 111568, The Effect of Hydrogen on the Mechanical Properties of Titanium and Titanium Alloy (83 pages, $2.25), prepared by Battelle Memorial Institute for the U.S. Army Ordnance Corps; and PB 111478, The Effect of the Cutting Fluid when Turning Titanium (15 pages, 50¢), by the University of Michigan's engineering research institute. Also prepared for the Ordnance Corps, the latter charts the cutting speed and effectiveness of a number of cutting fluids (e.g., sulfachlorinated oil) used on commercially pure titanium and its alloys.

•

Products Bulletin: New chemicals available from National Aniline Division, Allied Chemical and Dye Corp. (New York), are listed in a six-page free bulletin. Structural formulas, descriptions and properties of 51 chemicals and pharmaceutical intermediates are included.

•

Sedative Entry: Claimed to produce short-duration sedation without causing addiction, a new drug of Eli Lilly (Indianapolis) is also said to be virtually free of side effects. Named Valmid, it is 1-ethinyl-cyclohexyl-carbamate, reportedly can be used where barbiturates are undesirable or contraindicated.

•

Strength Booster: According to newly granted U.S. Pat. 2,708,644 (assigned to American Cyanamid), the tensile strength of nonwoven cellulosic fabrics can be increased by treatment with weak-acid aminotriazine resin colloids. The process is described as applicable to all-viscose fabrics.

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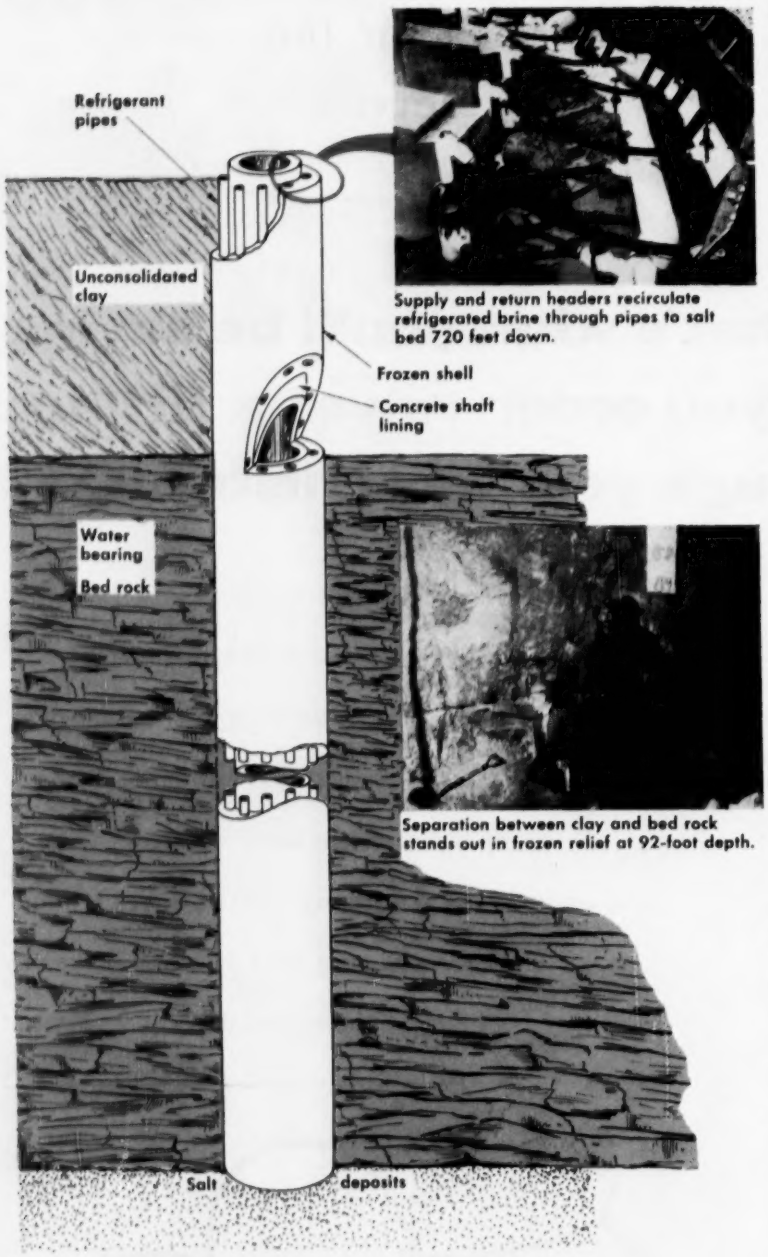
Stabilizer: The use of N,N'-diphenyl-*p*-phenylene diamine as a stabilizer for vitamin A esters is detailed in U.S. Pat. 2,708,628 recently assigned to Hoffmann-La Roche Inc. (Nutley, N.J.).



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Supply and return headers recirculate refrigerated brine through pipes to salt bed 720 feet down.

Separation between clay and bed rock stands out in frozen relief at 92-foot depth.

Deep Freeze Frees Salt

Salt consumption—from the average citizen's daily sprinkling of 10-15 grams to the chemical industry's whopping 13-million-ton annual bite—is on the increase as population and industry continue to grow.

A portion, at least, of that added appetite will be sated by production facilities that last month moved into full operation at Canadian Rock Salt Co. (Morton Salt Co. subsidiary at Ojibway, Ontario, Can.).

As salt mines go, there's nothing unusual about the CRS operation. It's a 500-ton/hour plant with the latest in handling equipment to move rock salt from mine through mill to storage and shipping. But the shaft through which the salt deposit is tapped is a tribute to mining ingenuity.

Soggy Site: Preliminary exploration of the site indicated that sinking the shaft wouldn't be an easy task. Most of the 720-ft. downward route lay through water-bearing strata that would keep the diggings flooded. But engineers were not easily discouraged, soon hit on the idea of refrigerating a core of earth to stem the subterranean flow.

Winston Bros. Co., which had pioneered an earth-freezing technique at Carlsbad, N. Mex., was called in to chill the Ojibway site. The piling-supported shaft collar was ringed by 28 closely spaced 10-in. drill holes extending down to the deposit. Refrigerant was then recirculated through hole casings until the encircled core was frozen solid.

Hollowing out the icy column and lining it with concrete were routine operations. Each stage of the sinking consisted of six rounds of drilling and mucking, followed by form setting and pouring. Work progressed rapidly with the aid of labor-saving equipment, such as the modern mucking machine which clammed rock from the face into a 1½-cu.-yd. hoist bucket.

But there were a few unique problems on the job. For one thing, brine had to be substituted for water in drilling rock at subfreezing temperatures. And special nonvented detonators were required for blasting.

Streamlined Process: Surface operations at Ojibway are carried on in straight-line flow. Salt, primarily crushed, is hoisted out of the shaft at the rate of 10 tons every 70 seconds, dumped into tipple bins. From there it travels by conveyor to the mill building for screening, crushing, and grading. Product is then conveyed to truck- or car-loading stations, or bulk-storage building. The latter serves as a "surge" for boat shipments and mill operation, enables a ship to be completely loaded without full mine operation.

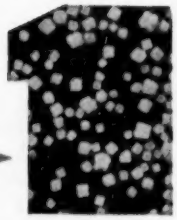
Though some of the erstwhile large outlets for salt (food preservation, refrigeration) have dwindled, others have sprung up to take their place. Highway ice control, for example, is expected to bring about 500,000 tons

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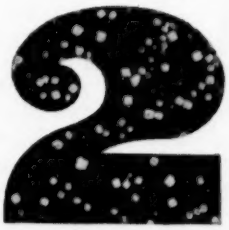
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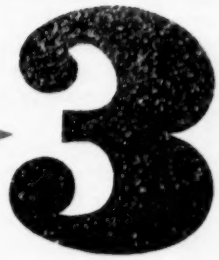
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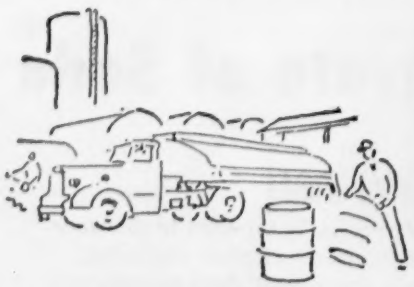
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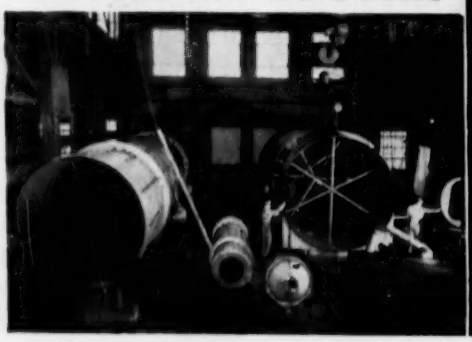
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of Ojibway's yearly output into the U.S. And with the chemical industry's growing need (for caustic-chlorine, sodium reduction of titanium), there's little likelihood that salt will have to go begging.

Extended Study

Process engineers working on methods of getting fresh water from the sea (or brackish sources) received encouragement from actions taken by the House and Senate last fortnight. The outlook is that the government's saline water program is certain to be extended and broadened.

On Monday, the House passed a bill authorizing an increase of funds from the present $2 million (for 5 years) to $6 million (for 10 years). And a Senate committee, the next day, approved one of its own to authorize a total of $10 million to cover the 10-year period.

Originally, the program—approved in 1952—authorized study on methods of obtaining fresh water for industrial, municipal or irrigational use from salt or brackish water. The increased funds would allow the Interior Dept., which administers the program, to prove out the processes it has been studying on a laboratory scale (*CW, March 12, p. 50*).

Both House and Senate measures allow the Interior Dept. to conduct some of its future work in government laboratories, thus remove the specific prohibition against this contained in the 1952 program. In addition, the Senate bill specifically provides that the Civil Defense Administration and the Atomic Energy Commission should be consulted when future research is being planned.

When the full Senate takes up the matter in the next few weeks, it will probably act to amend the House bill by substituting its own. After that's passed, it will then go to the Senate-House conference, where a compromise bill acceptable to both houses would be worked out.

But since there's virtually no opposition to the program, discussions will center primarily on the degree of broadening. And Congress will still have a chance to supervise it, for the bills authorize only the spending. Actual grants will be handled through normal procedures for handling appropriations to the Interior Dept.

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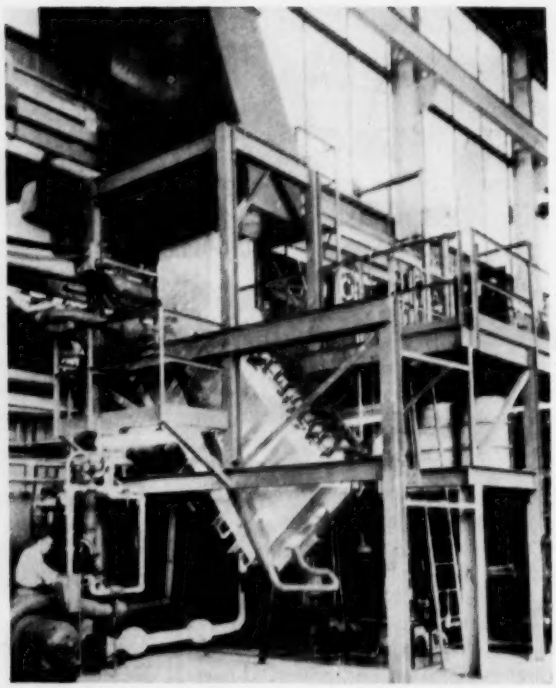
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MATERIALS AND FUELS: Creep lab (left) is important facet of nuclear studies; fossil fuels (right) share attention.

Covered On All Sides

As it literally threw open the doors of its research center at Alliance, Ohio, to the press late last month, Babcock and Wilcox revealed that it's a firm believer in playing both ends against the middle: while it's investigating (and building) nuclear reactors, it's working on some of the newer carbonaceous solid fuels, and hedging on both by studying oil.

B&W's interest in atomic energy dates back to the days of the Manhattan Project, in which it participated as an equipment designer and builder. Currently it's putting together some of the components for the first full-scale nuclear power plant to be located at Shippingport, Pa., and it's building—at Lynchburg, Va.—the first privately financed plant to make fuel elements for atomic reactors.

Some of the most important work it's doing now centers around new metals and alloys. At its creep laboratory, for instance, one of the biggest of its kind, it has 136 stations for determining creep strength and rupture strength of materials under prolonged exposure to high temperatures. This work could pay off handsomely in its atomic energy research. Here's why:

One of the biggest obstacles to economical nuclear power is the high first cost of materials. Type 347 stainless steels, for example, have been used extensively in the past. Aside from being expensive in themselves, these materials add to the fabricating cost because they're difficult to work with.

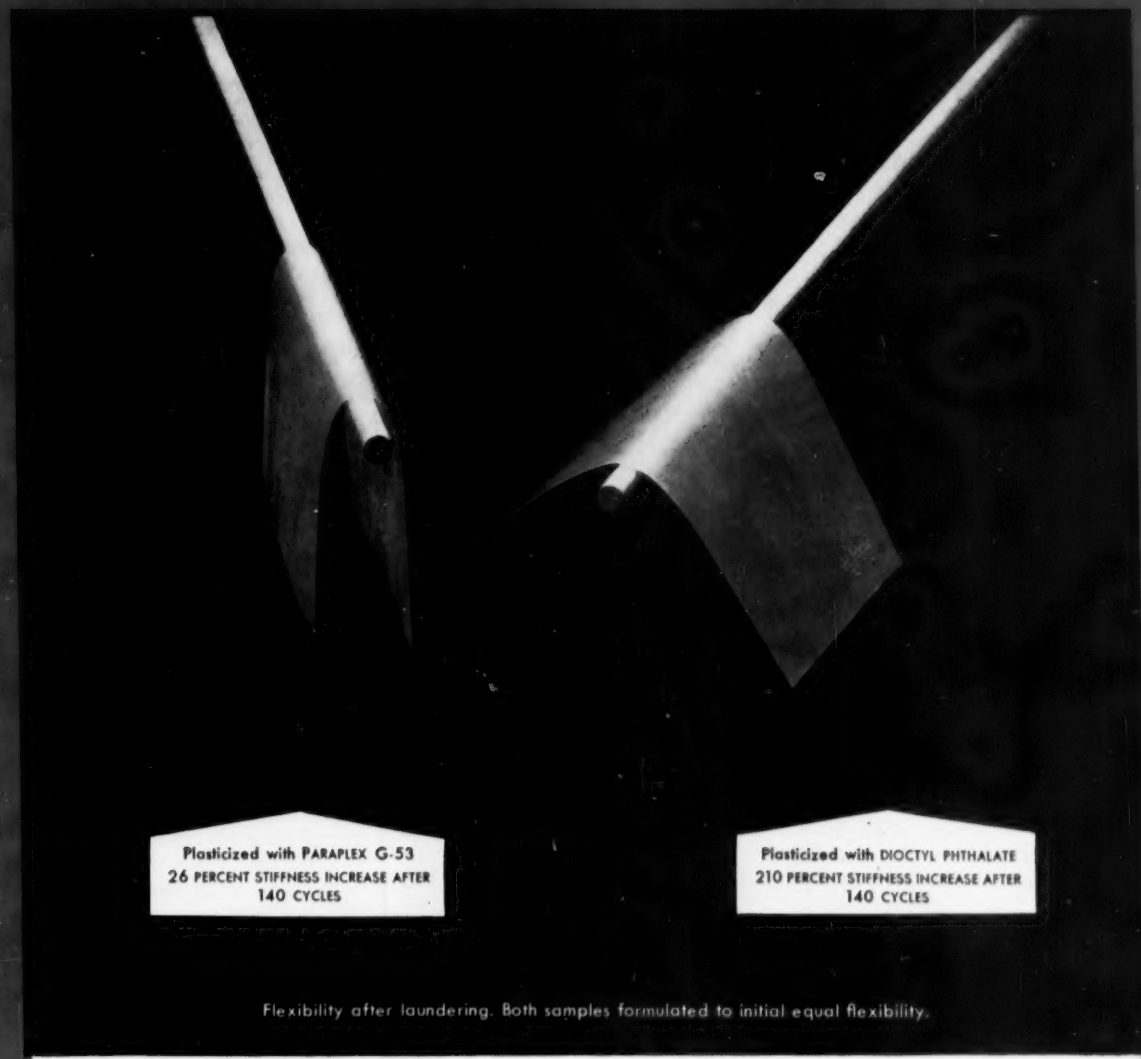
B&W is trying to prove that carbon steel and other less expensive metals can do the job. It has already proved to its own satisfaction that some of the cheaper materials are strong enough, but they entail problems of corrosion. When used in contact with primary cooling water, the metals can introduce undesirable corrosion products into the water, foul heat transfer surfaces and even become radioactive.

Despite the obstacles, however, B&W engineers are convinced that carbon steels can be used a lot more extensively in reactor systems. Indicative of what can be done, they feel, is B&W's use of low-carbon steel for the heat exchanger shells in the Shippingport plant.

Easier Opener: Another problem that's occupying a lot of their time is the matter of closures in nuclear reactors. In a liquid-cooled reactor, the core might have to be changed as frequently as once a month. This means that the system must be shut down, the reactor cut open and finally, after the core is changed, the reactor must be welded. Under such a procedure, downtime becomes a significant fraction of total operating time.

One obvious solution is to engineer systems in which the core doesn't have to be changed so often and that, undoubtedly, is an important goal of a lot of research. Babcock and Wilcox is exploring another alternative to help accomplish the same thing. It's developing a new gasketed closure for the reactors that would eliminate the need for cutting and rewelding.

Fossil Fuels: But while the nuclear energy program takes up a big portion of B&W's facilities, it's not overlooking means of improving present practices of steam generation based on coal and oil. It's now busily putting through its paces new petroleum coke resulting from Standard Oil of N.J.'s fluid coking process. As the company sees it, the petroleum industry will be turning more and more to the practice of extracting the lighter, more valuable



Flexibility after laundering. Both samples formulated to initial equal flexibility.

Watch out for plasticizers that wash out

Washing vinyl products like baby pants or hospital sheeting in hot, soapy water can be pretty tough on the vinyl plasticizer. Tough on an ordinary plasticizer, that is. PARAPLEX G-53 doesn't mind this kind of treatment. For example, samples of vinyl film containing PARAPLEX G-53 and samples containing dioctyl phthalate were laundered repeatedly in an automatic washer together with family wash. The films plasticized with PARAPLEX G-53 remained soft and supple; the others became hard and rigid.

This ability to stay put under actual washing conditions is just one feature of PARAPLEX G-53 polymeric plasticizer. When you add to that the plasticizer's resistance to extraction by aromatic and aliphatic solvents, you've got quite a combination. And what's more—PARAPLEX G-53 rebels against migration into lacquer, polystyrene, rubber, and baked finishes.

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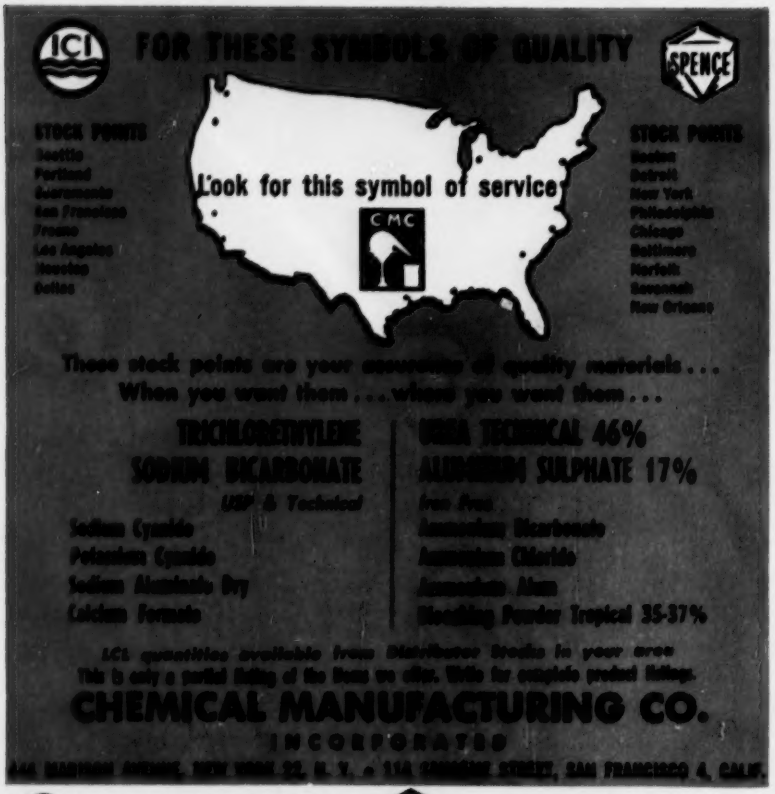
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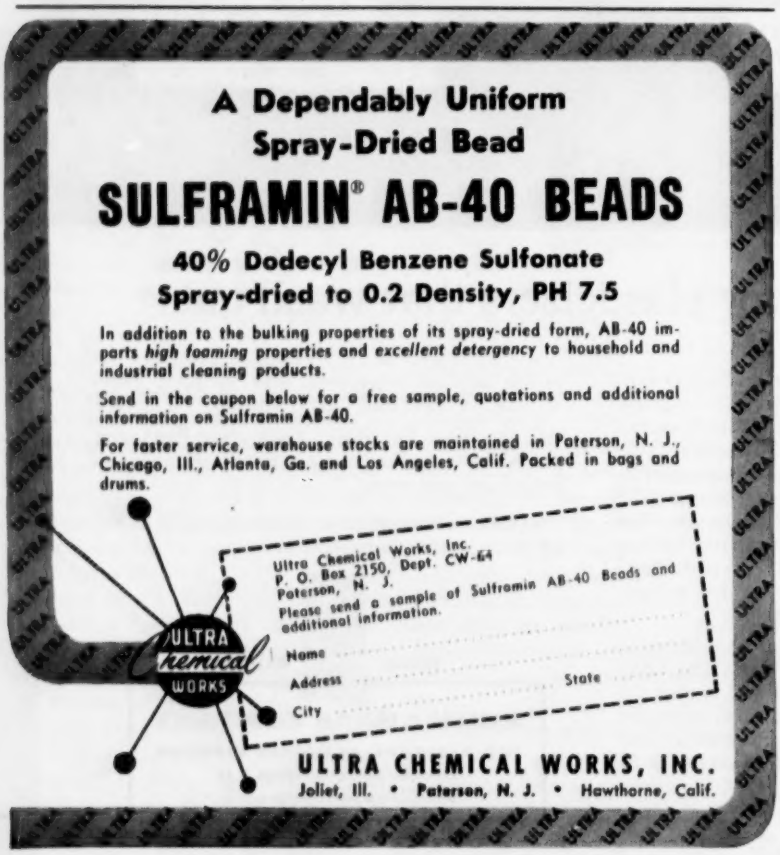
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constituents of oil. This in turn will increase the availability of coke and decrease the availability of residual oil.

Thus, it feels, it behooves operators using residual oil to make sure their furnaces can be converted to solid fuel firing. At Alliance, it has demonstrated that the coke can be used in its Cyclone Furnace, is currently working out the optimum arrangement for utilizing the coke.

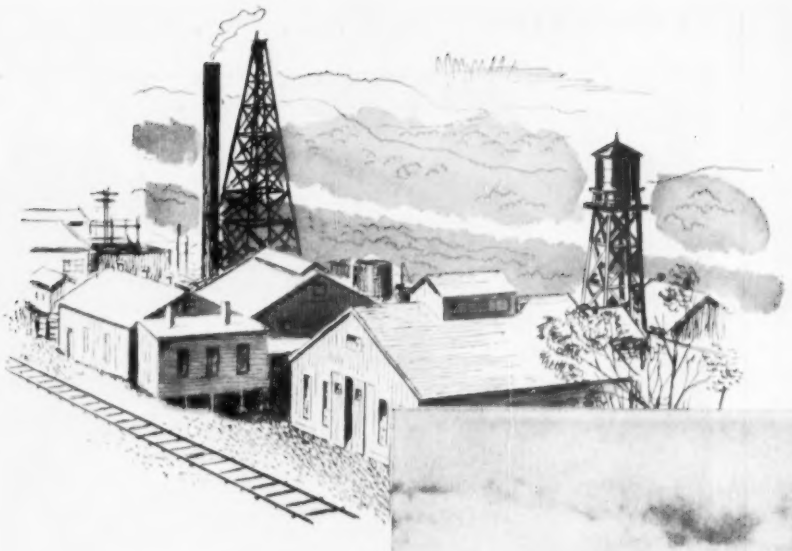
At the same time, it's studying the use of low-grade oils in the Cyclone. Present-day fuels have been satisfactorily adapted to the furnace and tests so far indicate that higher-viscosity oils can be used without difficulty.

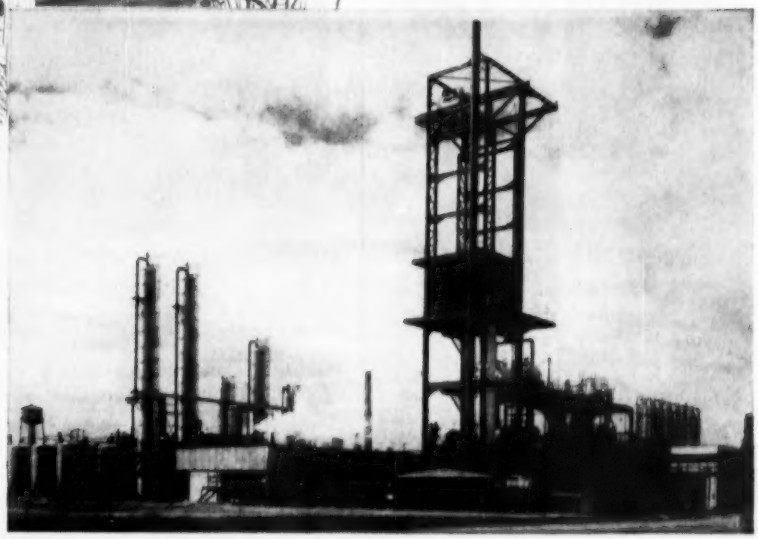
One of the complaints against some of the crude oils now being used as a fuel is a high content of sulfur and vanadium. The sulfur oxidizes to sulfur dioxide and presumably the vanadium acts as a catalyst to form sulfur trioxide. Although neither the sulfur dioxide nor trioxide are desirable, the trioxide in particular can raise havoc with stack gases. B&W engineers feel, however, that addition of dolomite inhibits the formation of trioxide without affecting the efficiency of the fuel.

Refractory Fiber: In another area of activity altogether, Babcock and Wilcox is finishing up process development work on its Kaolwool refractory fiber. Made by electrically melting kaolin clay and blowing it onto lengths of fiber, the material is being turned out in pilot-plant quantities.

This is a highly competitive field, in which several other firms have similar products. B&W feels it has an edge, however, because it does not have to use an organic binder to hold the fibers together and it has polished its process to the point where undesirable "shot" in the finished product is virtually invisible. In fact, it claims that its Kaolwool "as blown" is competitive with other products which have to go through an extra cleaning process.

Presently, the fiber is competing for a relatively small market as an insulator in the afterburners and tailpipes of jet engines. Like the rest of the field, B&W is actively tracking other, potentially bigger markets. Should they materialize, it would boost its present pilot production (a half ton/day) by building a commercial unit. The process, it feels, is just waiting for the markets to catch up.





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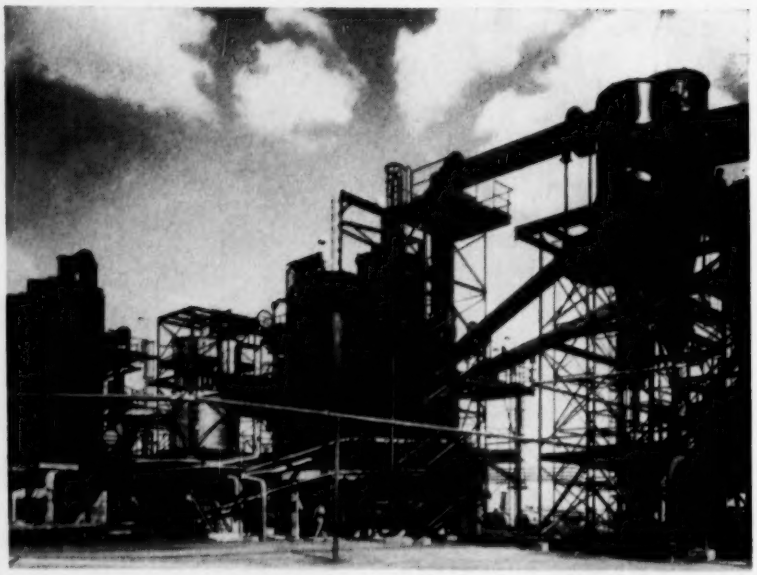
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SULFURIC PLANT: From gold to uranium to sulfuric is the . . .

Triple Play in Ores

Old-timers referred to pyrites as "fool's gold." But the pyrites-burning sulfuric plant pictured above shows that the name can actually be a misnomer. It's one of seven—built or being built—to help South African gold miners recover uranium from ores, some of which contain the needed pyrites in addition to the gold and uranium.

The South African gold-mining companies use the traditional cyanide process for extracting gold from the ores. In it, the ore is ground and treated with a solution of sodium cyanide, which dissolves the precious-metal content of the ores. But some of the gold-bearing reefs of the Witwatersrand series contain uranium—for years part of the waste products of the mines.

When uranium took on new importance as a source of nuclear energy, gold miners found themselves in the uranium business too; since 1950, 23 gold mines in the Transvaal and the Orange Free State have been officially approved as uranium producers. But that entailed sulfuric-acid plants. And because of the geographical position of the gold miners* and the sources of pyrites to be employed as raw material for the acid plant, it was decided that seven strategically located plants would do the job.

The plants range in capacity from 25 tons to 300 tons/day.

Little information has been declassified, of course, about the processing of uranium ores to metallic uranium. But it is known that the uranium is soluble in sulfuric, that gold is unaffected.

In this country (*CW, Oct. 23, '54, p. 50*), the uranium is dissolved in a mixture of hot sulfuric and nitric acids. The sulfates are precipitated as barium salts by addition of barium carbonate. The filtrate then contains essentially uranyl nitrate. This is extracted with ether, converted into uranium trioxide, and then reduced to the dioxide by treatment with hydrogen. Finally, the uranium dioxide reacts with hydrofluoric acid to form the tetrafluoride, which can either be reduced to the metal or converted into hexafluoride for separation of the isotopes.

Acid Bonus: All this has turned into a nice piece of business for American Cyanamid, whose subsidiaries, Chemical Construction and South African Cyanamid (Pty.) Ltd., have built six of the acid plants and are currently putting up the seventh. Because of the scarcity of elemental sulfur, the plants work off pyrites. In some cases, the pyrites are found with the gold and separated by flotation.

*Among the gold miners turned uranium processors who will be operating the acid plants: Stilfontein Gold Mining Co., Ltd.; Virginia O.F.S. Gold Mining Co., Ltd.; Randfontein Estates Gold Mining Co., Ltd.; Western Reefs Exploration and Development Co., Ltd.; Daggafontein Mines Ltd.; and the West Rand Consolidated Mining Co., Ltd.

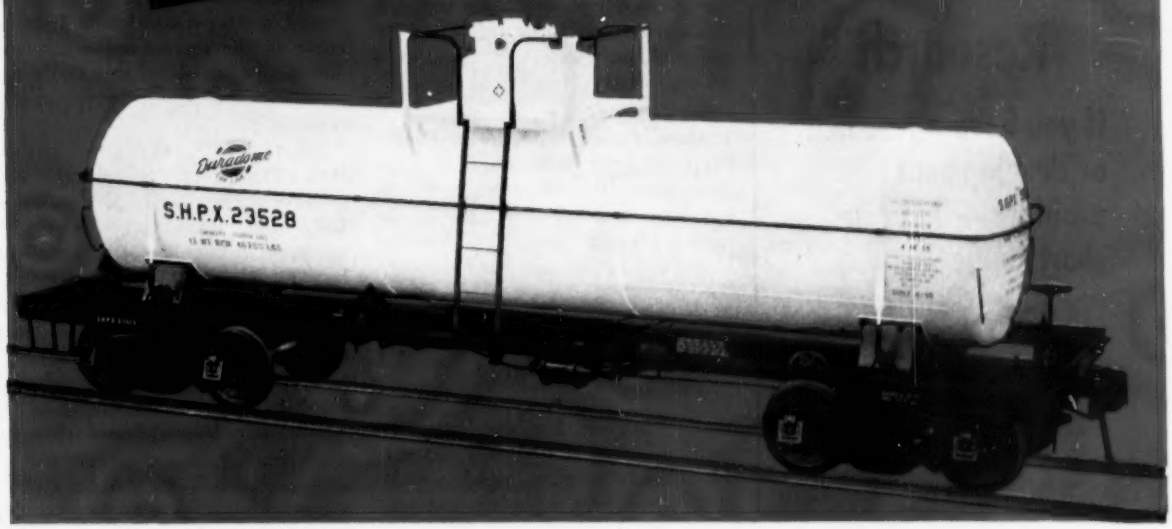
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EQUIPMENT

Sensitive Probe: Air Associates, Inc. (Orange, N.J.) has brought out a liquid-sensing unit that detects presence of liquid in 0.4 seconds, absence of liquid in 5 seconds. Powered by a tiny thermistor, probe has no moving parts to wear, clog or corrode. Unit can be used with a variety of liquids, including oil, water, and liquid oxygen over the temperature range from -319 to 200 F.

•

Ion Exchanger: Automatic regeneration at the flip of a switch is one of the key features of the Model MA-200 monocolumn demineralizer now offered by the Penfield Mfg. Co. (Meriden, Conn.). Designed to deliver 200 gph. of superhigh-purity water, the completely packaged unit utilizes a Penfield electric purity meter to control continuous operation, signal need for regeneration.

•

Vacuum Pump: Naresco Equipment Corp. (Newton Highlands, Mass.) has developed a 10-in.-diameter fractionating diffusion pump that can also be used as a booster pump. Designated as Model H-10-P, the unit has a throughput of 3,800 liters/second at 10 microns using Narcoil-40 pump fluid, 6,000 liters/second at 10 microns (as a booster) using Narcoil-10.

•

Sonic Analyzer: For nondestructive testing of solid and visco-elastic materials, such as glass, wood, metals, plastics, ceramics, adhesives and rubber, Kinetic Instrument Co. (Highland Park, Ill.) offers its new E-Scope sonic analyzer. The self-contained instrument features portability, high accuracy in measurement of natural or induced deterioration, flaws or inclusions, or product uniformity.

•

Gas Flowmeter: Reliability and sensitivity of control over low-volume gas flow are the key features of the Model 1315 Flowmeter now available from Hoke, Inc. (Englewood, N.J.). Primarily intended for accurate regulation of oxygen in the range from ½ to 9 liters/minute, the unit can be used with single or two-stage regulators at 50 psi., or can be attached directly to gas distributing system. Precision construction prevents "jarring off" of needle valve setting, facilitates sensitive adjustment.

Slug Analyzer: Bulky metallic specimen slugs, ranging from ⅜ to 1¼ in. in depth and from 4 to 10 in. square in cross section, can be accommodated in a new X-ray fluorescent analyzer designed by North American Philips Co., Inc. (Mount Vernon, N.Y.). The instrument can be supplied with its own goniometer and X-ray tube, or can utilize those of other Norelco spectrographic equipment that may be available.

•

Linear Control: The Bristol Co.'s (Waterbury, Conn.) Dynamaster thermocouple pyrometers can now be equipped to convert nonlinear millivolt signals into straight-line form for recording and control applications. Conversion is accomplished by a slidewire potentiometer and special cam designed to compensate for the response curve of the thermocouple involved. The device is tailored to provide outputs for computers, servo control systems.

•

Bulk Filters: To simplify the changing of filter refills, Houdaille-Hershey of Ind., Inc. (Lebanon, Ind.) has equipped its new line of Honan-Crane bulk oil filters with a quick-opening cover. Designed to operate on a bypass or continuous recirculation basis, the filters employ Cranite (Fuller's earth) or Palconia (inert cellulose fiber) to filter a wide variety of industrial oils. Nine different sizes are available.

•

Trio: From Omega Machine Co. (Providence, R.I.) this week comes word of three new aids to continuous automatic processing:

- Model 63 Activator is designed for preparation and feeding of activated silica used as a coagulant in water purification and waste treatment. The unit provides easy control of ageing concentration and ageing time, automatic stop of activant feed if silicate supply fails.
- Hi-Weigh—Model 37 continuously weighs and feeds dry materials at a rate of over 3,000 lbs./minute at an accuracy of plus-or-minus 1%. Special feature is a Sens-A-Gram controller, which provides proportional correction with negligible "hunt" action.
- Rotodip Model 65 is a corrosion-resistant volumetric feeder for the accurate metering of dilute or concentrated acids, alkalis and slurries

For prompt delivery . . . specify

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DU PONT Crystal Urea

(CARBAMIDE)

Dependably pure and uniform chemical with these rigid specifications:

- pH (10% solution at 20°C.).....7.0 to 9.8
- Water.....0.50% Max.
- Ash.....35 p.p.m. Max.
- Iron..... 2 p.p.m. Max.
- Free Ammonia.....20 p.p.m. Max.
- Color, A.P.H.A. (10g. in 100 ml. methanol) .....10 Max.
- Turbidity, A.P.H.A. (50g. in 100 ml. water) .....20 p.p.m. Max.

How industry uses this versatile chemical:

The purity and uniformity of Du Pont Crystal Urea make it ideal for use in a large number of products and processes. Listed below are some of the many fields in which it is being used today.

ADHESIVES: Manufacture of urea-formaldehyde resin adhesives, including plywood and paper adhesives, binder for composition board made of wood waste, cold-set glues, laminating resins, and core binders . . . solubilizer in casein, animal and starch glues.

FINISHES: In enamels and other finishes in the form of modified urea-formaldehyde resins . . . in fire-resistant paints.

PAPER: In urea-formaldehyde resins for imparting wet strength to paper and paper coatings . . . softener for glassine paper and similar products . . . ingredient in fire-resistant compositions . . . solubilizer for starch in coatings.

PLASTICS: Manufacture of urea-formaldehyde resin molding compositions.

TEXTILES: In urea-formaldehyde resins to improve crush and crease resistance . . . in acid and direct dyes for screen and roller printing of textiles . . . with starch and other materials for sizing and finishing many types of textiles . . . in flameproofing compositions.

Du Pont Crystal Urea also finds many uses in such fields as cosmetics, detergents and pharmaceuticals.

Du Pont Crystal Urea is packaged in 100-lb. multi-ply paper bags. Prompt shipment can be made from strategically located stock points.

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- ☐ AMMONIUM BIBORATE
- ☐ AMMONIUM PENTABORATE
- ☐ POTASSIUM TETRABORATE
- ☐ POTASSIUM PENTABORATE
- ☐ SODIUM METABORATE
- ☐ SODIUM PENTABORATE
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from 0-1800 gph. Other advantages claimed: versatility, repeatable accuracy to 1%, adaptability to automatic control.

Ceramic Cover-up

The chemical stability and high heat resistance of ceramics can now be imparted to a variety of materials by the Flame Spray Ceramics coating process, developed at Armour Research Foundation of Illinois Institute of Technology (Chicago). Similar to spray metalizing, FSC utilizes a simple flame gun to build up sintered layers of refractory and chemically inert materials, such as aluminum or zirconium oxides, on base metals.

Sprayed coatings are easier to apply than ordinary vitreous coatings, which require heating both metal and ceramic to high temperatures. And they are said to be extremely effective for protecting metals, such as steel and even aluminum, against high-temperature erosion. In many cases, says ARF, the underlying metal can be melted without causing coating failure. Since the two basic ceramics are stable oxides, they are not subject to deterioration from further oxidation.

Hardness of the aluminum coating surpasses that of tool steel, suggests its use for protecting soft metals (aluminum, die-cast alloys, mild steel) against erosion and abrasion in pump impellers and housings, fan blades, turbines, piping subject to cavitation.

Though the zirconia coating is somewhat softer and more difficult to apply, it is even more refractory and inert than alumina. This higher degree of corrosion- and heat-resistance may make it ideal for liners used in rockets, flame ducts, burners, etc.

In thicknesses up to about 10 mils, ceramic layer is unusually adherent. But with heavier applications, residual stresses may cause failure on sudden heating or cooling.

Like all sprayed coatings, flame-sprayed ceramics are porous, don't provide perfect protection against chemical corrosion. But this weakness can be largely overcome by overcoating with ARF-developed Solution Ceramics, or by cospraying with soft metals. Process is available through Continental Coatings Corp. (Chicago), which has the basic agreement with rights to sublicense other contract applicators.



Note the compactness of Commercial Solvents Corporation's new 225-ton-per-day Stengel Process Ammonium Nitrate Plant at Sterlington, La.

Crystalline

AMMONIUM NITRATE FERTILIZER

in one simple step

THROUGH C & I



Actual Crystal Size

C & I can now license the new CSC Stengel Process to users and furnish complete plants to produce crystalline ammonium nitrate (33.5% N). Due to simplicity of design, capital and operating costs of these plants are substantially less than similar plants using prilling and granulating processes.

FREE FLOWING In this process, ammonium nitrate of any desired particle size can be produced in a single step. Actual spreading tests in the field have proved that this crystalline ammonium nitrate is completely free flowing with a more controllable flow than competitive products.



Solidified ammonium nitrate sheet is broken into small bits by rotating spoke shaft.

NON-CAKING This new exclusive process produces a very low-moisture material permitting satisfactory long term storage. The coating on the particles reduces to an absolute minimum the tendency of ammonium nitrate to absorb moisture.

C & I ammonium nitrate plants using the Stengel Process can also produce limed ammonium nitrate (20.5% N) and ammonium nitrate sulfate (26.5% N). These plants are constructed at a fixed price with production and efficiencies guaranteed.

C & I can also furnish nitric acid and complex fertilizer plants (using PEC process) on this same basis.

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CINCINNATI 26, OHIO

Briefs

from Recent Literature

Ethylene Oxide

Organic esters, useful as detergents and where slight acidity is desired without corrosive attack upon metals, as in metal pickling baths and in the removal of milkstone from dairy equipment, are prepared using lower alkyl-, carboxymethyl-, diethers of polyoxyalkylene glycols as intermediates.

Anti-foaming agent, effective for aqueous media in pressure boilers operating at 200 p. s. i. and above, is a diether reaction product of straight-chain 1:12 octadecanediol and ethylene oxide, in a 1:18-25 molar ratio, in the presence of an alkaline catalyst.

Regenerated cellulose films and sheets are given excellent slip characteristics and prevented from sticking together, even under pressure and elevated temperatures, by impregnation in the gel state with an ethylene oxide-stearic acid condensation product in combination with glycerol and colloidal silica.

Wetting and emulsifying properties are exhibited by hydroxy esters of long chain phosphonic acid, prepared by heating n-octadecane phosphonic acid and ethylene oxide in an autoclave in the presence of aluminum hydrosilicate as catalyst.

Water-in-oil type petroleum emulsion breakers are prepared by the oxyalkylation of certain phenol aldehyde resins, particularly those derived from a phenol having an ortho or para hydrocarbon substituent having 14 carbon atoms. Such products are also useful as wetting, detergent and leveling agents.

These developments are abstracted from recent publications or U. S. patents. They may suggest applications of Ethylene Oxide in your products or processes. Permission to practice inventions covered by unexpired patents can be given only by the owners thereof.

Jefferson's products are offered with the understanding that the user will make his own tests to determine their suitability for his purposes.

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ETHYLENE OXIDE



Reacts readily with organic compounds possessing one or more labile hydrogens. Many such derivatives of Ethylene Oxide find wide use as emulsifiers, dispersants, stabilizers, degreasers, solubilizers, and penetrants.

Our technical service staff will be glad to work with you on the handling, storage and uses of Ethylene Oxide. Available in 4,000- and 10,000-gal. tank cars, 400-lb. net (ICC 5P) drums, or in samples for your evaluation. Technical literature will be sent promptly on request.

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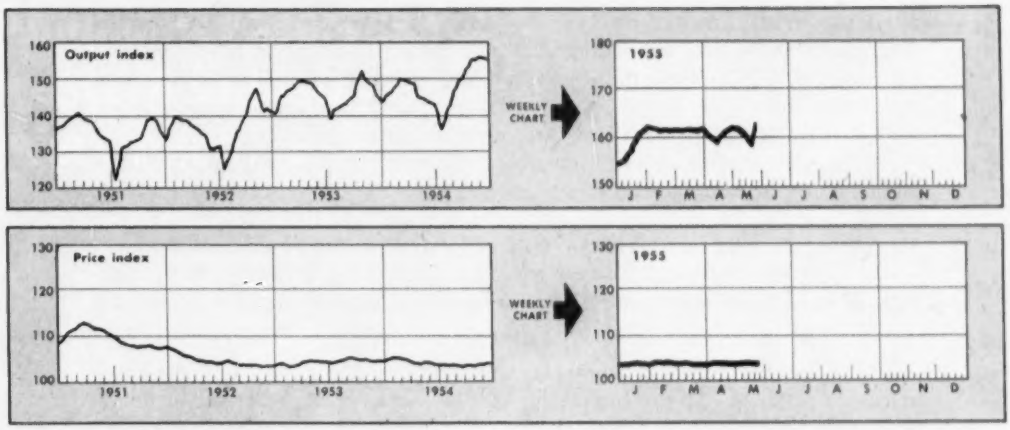
West Coast Sales Agent: Nelson A. Howard, Jr., Los Angeles

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Ethylene Oxide, Glycols, Dichloride
Ethanolamines
Nonyl Phenol
Morpholine
Ethylene, Propylene and Glycerine Carbonates
Polyethylene Glycols

MARKETS . . . . . .



WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947-49 = 100)	165.8	165.1	144.4
CHEMICAL WEEK Wholesale Price Index (1947 = 100)	104.3	104.3	104.2
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	417.2	407.1	300.8

MONTHLY INDICATORS—Production (Index 1947-49 = 100)	Latest Month	Preceding Month	Year Ago
All Manufacturing and Mining	137	137	124
All Chemical Products	165	165	147
Industrial Chemicals	182	182	150

MARKET LETTER

A year to the day brings a repeat of a price change on perchlorethylene. Dow Chemical is serving ample notice to customers that prices will go up ¼¢ to ½¢/lb. effective July 1. Thus the firm again blazes the price-hike trail—likely to be followed by all other producers—as it did back in July '54.

Not all marketers today, though, are certain the move is propitious; at least one claims that "a lower price would probably sell a lot more." Dow, of course, feels that a higher price is justified, cites increased manufacturing costs (including those engendered by settlement of their recent strike).

Perc movement is currently quite good, and it's a cinch there's a surge in sight as consumers hasten to beat the increase deadline.

•

A boost that didn't take knocks some major iodide prices this week back down to a pre-February level (*CW, Market Letter, March 5*). Among the items shedding the previous 25¢/lb. increase: potassium iodide, now selling at $1.90/lb.; sodium iodide at $2.55/lb.; and resublimed material at $2.30/lb.

Behind the abortive attempt at higher prices are some age-old marketing factors—slow demand, keen competition for what little business is available. Stockfood industry iodide users in particular have of late been market-shy.

•

Synthetic detergents continue to munch away at the soaps and

syndets market. Latest data from the Assn. of American Soap & Glycerine Producers notes that sales of synthetic detergents (for the first quarter) represented 62% of the total market, an increase of 2% over the final months of '54.

Here's this year's quarterly comparison:

• Reported sales of syndets: 552,841,000 lbs., valued at $127,144,000; up, in tonnage, 14%, dollarwise, 13%, over the previous quarter.

• Total soap sales: 335,937,000 lbs., valued at $78,334,000. That's 4% higher in pounds, 8% better on the dollar side than 54's final quarter.

Compared with the first three months of '54, however, the pound picture now shows a decline: 2.5% for synthetic detergents, 17% for soaps.

•

Some gum rosin buyers are abandoning their wait-and-see-how-prices-go attitude. At the beginning of the season many decided to delay purchases, hoping to pay less later (*CW, Market Letter, April 16*). By this week, however, it's apparent that the lateness of the gum crop, plus rising costs, may preclude any immediate drop in prices. These factors are swaying a few once-hesitant users to replenish stocks for anticipated summer requirements.

Trade in rosins—both wood and gum—is fairly active; prices, generally, are firm.

•

Procrastination on the part of fertilizer buyers is one reason coke-oven ammonium sulfate producers will offer bargain prices on shipments made during the next six months. Bulk price of the sulfate—now reportedly backing up in a number of producing areas—will remain pegged at $42/ton, f.o.b. plant, but customers who buy for June-through-October deliveries will get price breaks ranging from $1 to $3/ton.

The seasonal discounts work out to $3 off the plant quotation for June-July orders; a $2/ton saving through August and September; and $1/ton off for October-November shipments. (Ammonium sulfate prices at ports [Norfolk, Va., Charleston, S. C., Savannah, Ga.] will remain unchanged at $44/ton.)

Hope of steelmakers behind the discount device is twofold: whittle current stocks, and, over the long haul, induce farmers to spread their purchases over more months of the year.

•

Some low-temperature epoxy plasticizer users last week were handed a 4¢/lb. cut. The producer, Argus Chemical (Brooklyn) posted a 40¢/lb. (bulk, freight allowed and prepaid) tag on its Drapex 3.2.

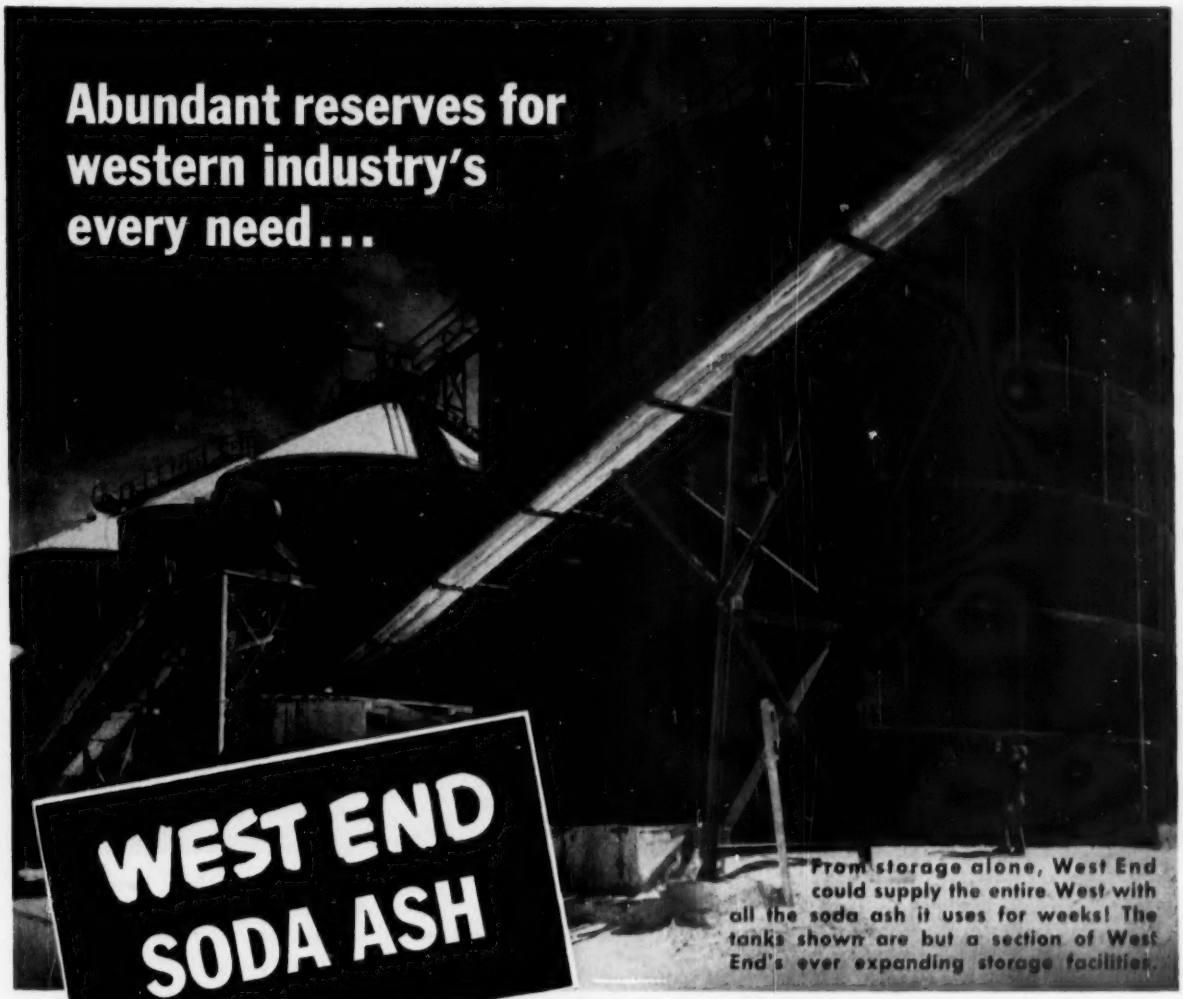
The material, an octyl epoxy stearate, is said to be comparable to dioctyl sebacate, and is aiming for all vinyl product outlets requiring low-temperature flexibility.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending May 30, 1955

	Change	New Price		Change	New Price
UP					
Perchlorethylene, tanks, dlvd. E.	$ .0025	$ .1100	cyanide, 2,500-oz. lots	$ .00375	$ .81125
Silver salts:			nitrate, 2,500-oz. lots	.0025	.59875
chloride, 100-oz. bottles	.0025	.81375	oxide, 100-oz. bottles	.00375	.8850
DOWN					
Mercury, metal, 76-lb. flask per net flask	$2.00	$300.00	Potassium, drums	.25	1.90
Iodides:			Sodium, USP, bottles, drums	.25	2.55

All prices per pound unless quantity is stated.

Abundant reserves for western industry's every need...



WEST END SODA ASH

From storage alone, West End could supply the entire West with all the soda ash it uses for weeks! The tanks shown are but a section of West End's ever expanding storage facilities.

For 30 years, West End has been constantly enlarging its manufacturing and storage facilities. Regardless of market conditions, normal and emergency needs of customers are served promptly and completely. Fast, economical transport by rail or truck to any point in the West.

Write for samples, prices and technical data.



PERSONAL SERVICE — Customers anywhere in the West are only a few hours away by company plane.





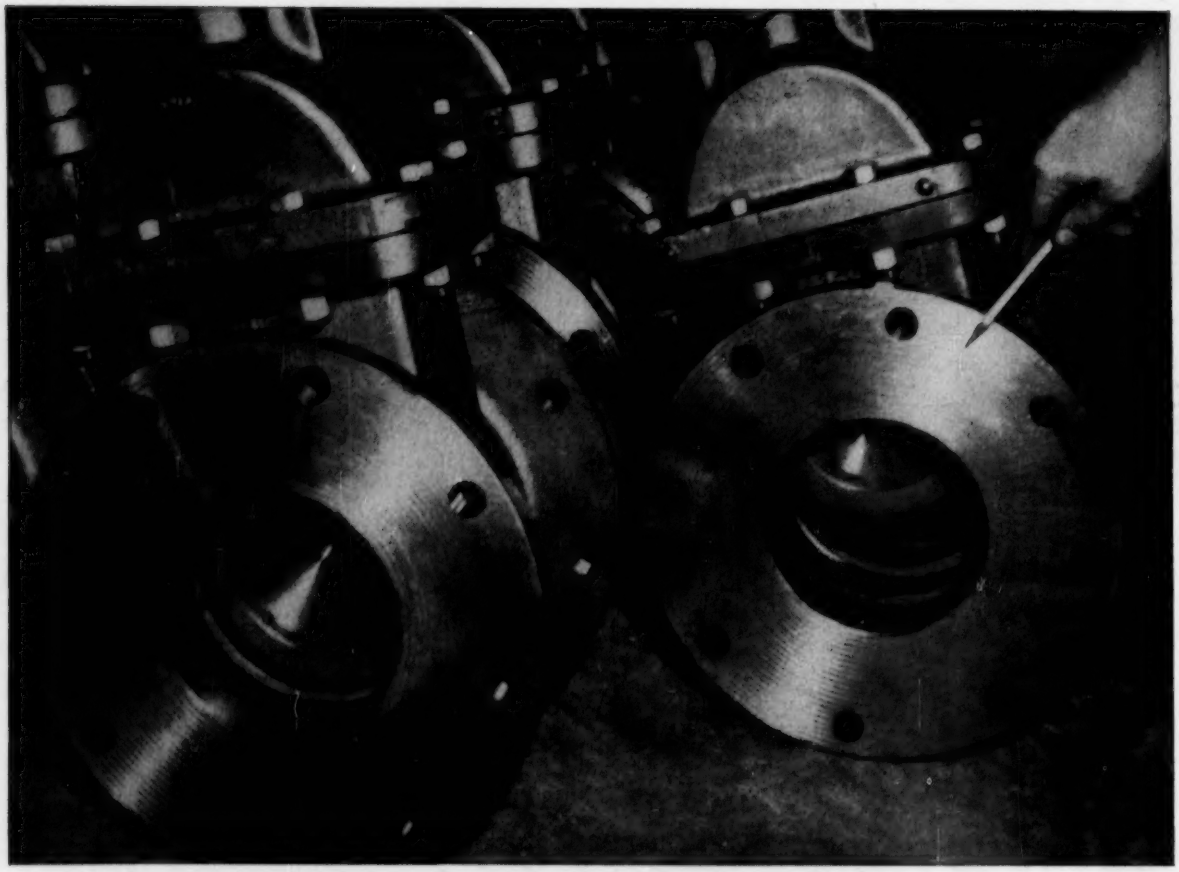
IMMEDIATE SHIPMENT to customers throughout the West in company's own leased hopper cars . . . ready at all times.

30 MINUTE IN-AND-OUT LOADING for bulk trucks at any hour of day or night through "serve yourself" delivery.

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West End Chemical Co.

Executive offices: 608 Latham Square Building, Oakland 12, California · Plant: Westend, California



Corrosion handcuffed in alcohol-acid plant. These valves of "HASTELLOY" high nickel-base alloy assure the desired uninterrupted operation between inspections. Produced by Hasco Valve and Machine Co., Milwaukee, Wisc.

Nickel-base alloy stops unscheduled shutdowns

. . . handles 50-60% H_2SO_4 at 200-250°F

Meet some valves that show exceptional corrosion-resistance. They are made of HASTELLOY alloy D, a high nickel-base alloy.

A large oil refinery installed these valves in plants that process and concentrate sulphuric acid, which, in turn, is used for producing isopropyl and ethyl alcohol and ethers.

And here's what this user writes:

"At present, the units are on a four-month scheduled inspection and repair interval. HASTELLOY *alloy D fittings are the only ones available that do not require unscheduled shut downs for replacement and accompanying loss of production between these inspections.*

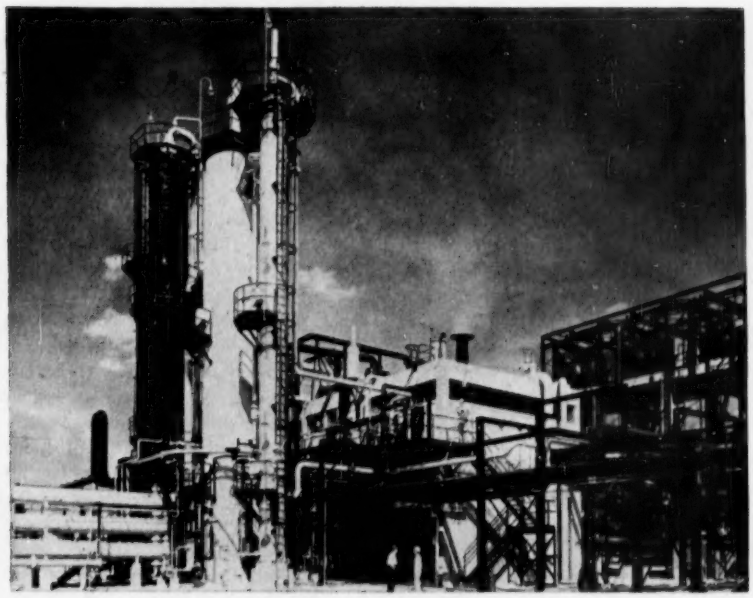
Scores of users report similar savings where equipment is exposed to strong corrosives.

You, too, may obtain excellent results by using one of the series of nickel-base alloys produced and sold under the trade-mark "HASTELLOY" by Haynes Stellite Company, Kokomo, Indiana, a Division of Union Carbide and Carbon Corporation.

Whatever your corrosion difficulty, make use of our wide practical experience. Send details of your problem for our suggestions. Write us today.

INCO TRADE MARK

THE INTERNATIONAL NICKEL COMPANY, INC. 67 Wall Street New York 5, N. Y.



ETHANOLAMINE OUTPUT SOARS with Allied's new Orange, Tex., facilities.

Switch for Three

U.S. ethanolamine production, certain to hit an 80-million-lb. level in '55, will continue to climb, probably reach toward an impressive 100-million-lb./year rate within two or three years.

Significant switches in consumption now has diethanolamine out-running monoethanolamine, with once-top triethanolamine trailing in third position.

In a set of triplets, one youngster consistently outshines his siblings. But in the commercial development of the three ethanolamines, mono-, di- and tri-* this hasn't been so; each, in the recent past, has at times achieved top billing. And now, with the total domestic market for ethanolamines soaring toward the 80-million-lbs./year mark, further shifts are under way.** Currently, diethanolamine has eased from second into first place, ousting mono- as the most important, percentagewise, of the ethanolamines consumed in this country (*see Table 1*). Tri-, on the other hand, will most likely continue to run a poor third. The slithering has been dramatic—some 30% in less than five years. In terms of millions of pounds, the three products should line up like this, come the first of 1956: DEA, 32; MEA, 28; TEA, 20.

*Abbreviated here as MEA, DEA, TEA.

** Last year production of the three totaled 63 million, in '53 about 53.4, and in '52, some 44 million lbs., or roughly half the estimate for '55.

Ethanolamine Entrants: At the moment four major producers supply the ethanolamine market, and at least one additional firm is getting ready to plunge. There's talk too, that still another potential producer, a prominent Midwest detergent manufacturer, may join the roster. Olin Mathieson, however, is starting construction, at Brandenburg, Ky., for commercial production of ethanolamines.

Excluding Olin Mathieson, today's list of makers—plus a *CW* estimate of their capacities—reads like this:

Ethanolamine Capacity
(millions of lbs.)

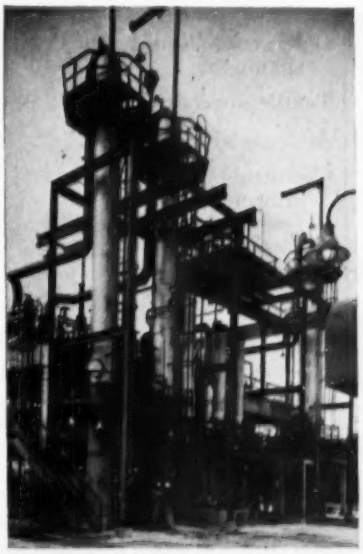
Carbide and Carbon	40-50
Dow Chemical	20-25
Jefferson Chemical	10-15
Nitrogen Division, Allied Chemical & Dye	10-15

Pertinent feature facing any ethanolamine newcomer is the impressive rise in DEA demand. Chiefly bolstering its use is the steady growth of detergent consumption generally, as well as the suddenly expanding outlets for the Ninol-type detergent. Reason for the latter: some basic Ninol patents expired last August, and detergent makers are moving fast to exploit this market.

Assurance is high, too, that increased amounts of DEA, as a chemical intermediate, will move into petroleum demulsifiers, rubber accelerators, morpholine, corrosion inhibitors, etc. It's a moot question, though, whether or not DEA in textile specialties will change significantly. Actual pound sales may well increase, but percentage share will probably fall off.

There's little doubt that diethanolamine as an acid gas scrubber is due for a steady wane, although use, by petroleum refiners, in liquid-liquid extractions, is expected to continue at an even rate. But refinery gas producers are turning more and more toward monoethanolamine, and away from the di-, for scrubbing out hydrogen sulfide. MEA is easier to recover and is far more soluble in hydrocarbons than DEA.

The outlook for mono- grows brighter in proportion to the increased removal of hydrogen sulfide by gas producers. Already some 90% of the gas scrubbers use MEA, buy 40-50% of the total mono- consumed. And this percentage is bound to go up as consumption of natural gas—from which both CO_2 and H_2S are being removed



JEFFERSON'S capacity expands, too—some 50%—at Port Neches, Tex.

Table 1

Ethanolamine Use

	1951	'53	'55-'56
DEA	18%	31%	40-43%
MEA	27%	37%	35-37%
TEA	55%	32%	20-25%

—increases. The hike to date has been about 10%/year. New cross-country pipelines will be one nudge for gas use.

Then, too, refiners are now paying greater attention to sulfur recovery than heretofore. (Sulfur is poisonous to certain catalysts in the production of ammonia from natural gas.)

Another area where MEA has garnered favor is in coconut fatty acid amides used as builders of synthetic detergents. Since Procter & Gamble still owns certain basic patents, though, it's likely that detergent usage of MEA will notch a smaller share of the consumption pattern as acid gas scrubbing grows.

Monoethanolamine's position in

Table 2

Diethanolamine Use (1955)

Detergents (liquid and shampoo)	35-40%
Textile specialties	20-25%
Acid gas absorbent	17-25%
Chemical intermediates (emulsifiers, rubber accelerators, morpholine)	15-20%

production of chemical intermediates is not expected to do much shifting. It will continue to move regularly into cellophane (as a plasticizer), cosmetic creams, household polishes, and many other outlets.

TEA Trailer: Although triethanolamine was the first of the ethanolamines to be produced in commercial quantities, its consumption, relative to DEA and MEA, has been declining since 1952 (*see Table-4*). A major loss to the TEA market came when herbicide formulators switched from 2,4-D salts, for which this ethanolamine was used as a solubilizer, to 2,4-D esters. The formulators also turned to the cheaper methylamines during the past three years. Its use as an acid gas scrubber began to drop off almost as soon as MEA and DEA were available commercially.

Table 3

Monoethanolamine Use (1955)

Acid gas absorbent	45-50%
Nonionic detergents	25-30%
Chemical intermediates	15-20%
Miscellaneous	5-10%

At this time, toilet-goods manufacture appears to have the rosiest potential on the list of TEA uses. About half of the output goes into emulsifiers of mineral oils, lanolin, beeswax, etc.; for cosmetic creams, brushless shaving creams, hand lotions; some into shampoos, etc. For a while TEA was out of favor in cosmetic trade—it has poor hard-water resistance. By use of sequestering agents various popular formulations are now selling again, boasting the mild, bland effect of

Table 4

Triethanolamine Use (1955)

Toilet goods (cream emulsification, detergents, shampoos)	50-55%
Textile specialties	15-20%
Waxes and polishes	5-10%
Miscellaneous (petroleum demulsifier, rubber chemicals, cement grinding aid)	20-25%

TEA as an emulsifier intermediate.

But in detergents the trend is toward amides rather than amines. Since TEA does not form amides, it is losing sales to DEA and MEA. And less share of the output of TEA will go to the manufacture of dye substantives, petroleum demulsifiers, cement-grinding aids. The housewife has had a hand in cutting back TEA's markets, too, favoring the rubless floor polishes over waxes with TEA. But TEA salts may find steady use as corrosion inhibitors in glycol-base antifreezes.

Ethylene Spawned: The three ethanolamines have, of course, opened markets for the petrochemicals ethylene and ammonia. Now the prospects are certain that U.S. ethanolamine-production logs will be reading 100 million lbs./year within 2 or 3 years. The ethanolamine trilogy has swept into a multitude of markets, is now an unquestioned heavyweight in the petrochemical industry.

Out of Streams

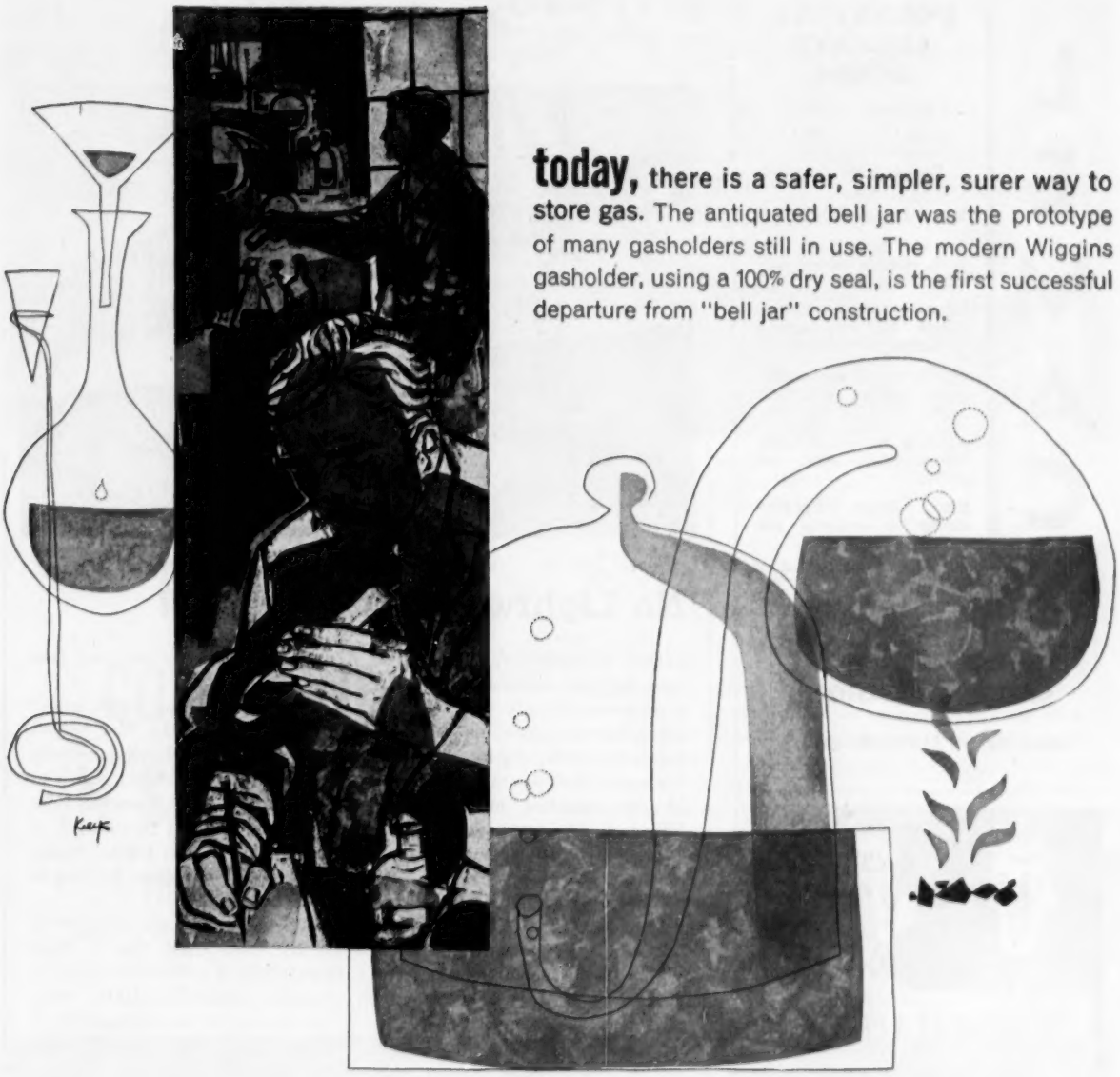
Markets are normally hard to find for waste products exuding from many allied chemical process industries, but pulp and paper makers—in Wisconsin, at least—have come across a profitable one. Spent sulfite liquor is being increasingly used as a road binder material.

This year more than 80 million gal. of the liquor will improve roads instead of going to waste in the state's streams. That amount represents an increase of some 20 million gal., or 33% above the sulfite road binder volume consumed in '54.

Actually, the hike has been a steady one. Since World War II, each year has shown a 30% or better growth in use for the road outlet. A survey just completed of each mill's 1955 program is the basis for the whopping 80-million-gal. estimate.

Explaining the widening market, Robert L. Smith, research chief of the Lake States group, has this to say: "Most sulfite mills are finding it possible to sell larger quantities of road binder each year. Once a road supervisor starts using this material, next year he generally extends its use to more miles of the roads in his care.

"This growth, plus new uses added to the list, has kept the annual totals climbing—and '55 will follow the same pattern."

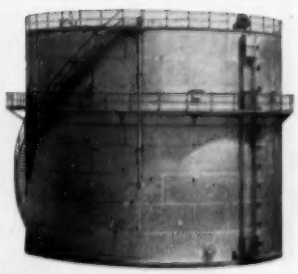


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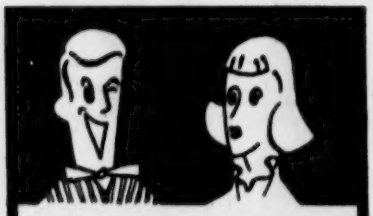
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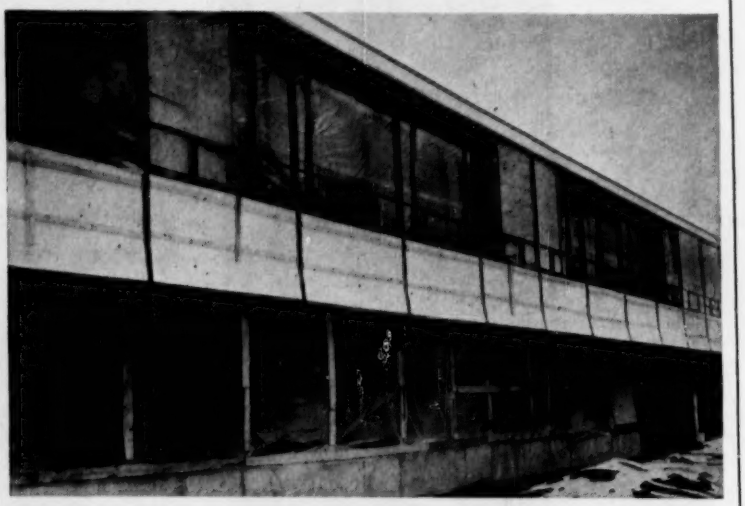
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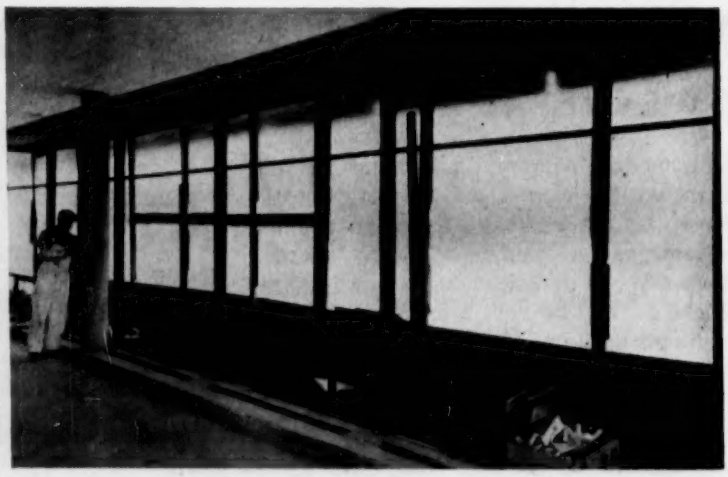
No Lightweight Outlet

SOME POLYETHYLENE market analysts are convinced that U.S. productive capacity will this year reach the worrying-about level, sure that supply will out-pace demand as the material strides toward the title of the chemical industry's first billion-pound/year plastic. But though there are some pessimists, enterprising marketers are out hustling for new outlets.

One such is use of polyethylene film as a thin, tough, temporary wall on construction jobs. For example, work on an addition to Sharon (Conn.) Center School, begun in Dec. '54, was carried on during the winter protected by some 5,000 sq. ft. of the material (*see top cut*).

Blocking winds up to 65 miles/hour in velocity, the film helped hold in heat from gasoline-burning hot-air heaters, permitting brick to be laid even when snowing. The translucent material transmitted so much daylight (*see below*) workmen needed no artificial lighting to work "indoors."

Made of Bakelite polyethylene by Visking Corp., the film is four-thousandths of an inch thick and 13 ft. wide, supplied in 100-ft. rolls. Cost is said to be comparable to special types of kraft paper often used on construction jobs.





IN CLEANERS AND POLISHES for Oldsmobile and other fine cars, CMC serves both as a suspending agent and thickening agent. Known as Liquid Glaze—made by Liquid Glaze, Incorporated, Lansing, Michigan, these polishes containing CMC have long shelf-life; give lacquer and enamel finishes lasting protection against weathering and the chemicals used on highways in winter months.

TO KEEP COMPOUNDS IN SUSPENSION

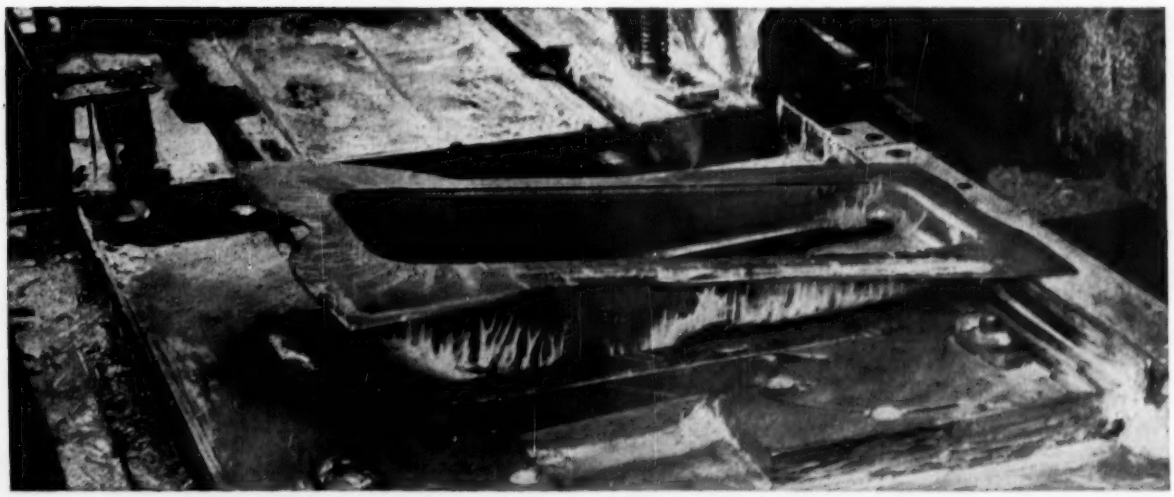
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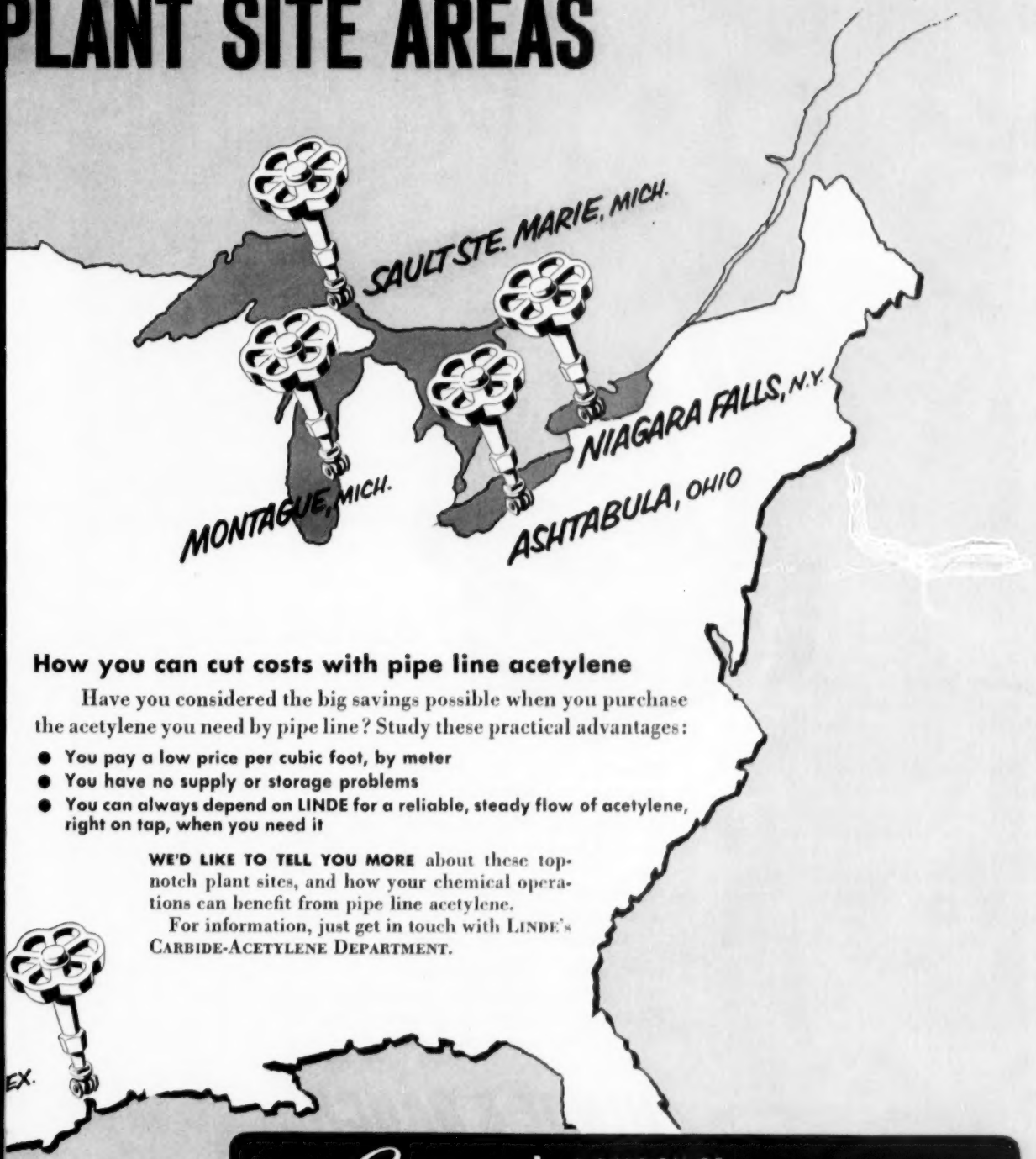
LINDE's four other pipe line acetylene areas, announced earlier, are: Niagara Falls, Ashtabula, Sault Ste. Marie, and Portland. In these and the two additional areas—Texas City and Montague—chlorine, HCl, and other basic materials are generally obtainable nearby. Electric power and fresh water are available . . . a choice of transportation methods is provided . . . established markets exist for many chemical products.

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Stopped Before They Start

Pre-emergence herbicide use picks up in '55, as more corn, cotton and peanut growers find them profit builders.

Favored compounds include Chloro-IPC, CMU and related compounds, SES, and the old stand-by, 2,4-D and its low-volatile esters.* Others show plenty of promise, too.

Probably the farmer will never take to agricultural chemicals like the soil scientists believe he should. Ofttimes, growers seem slow to accept worthwhile chemicals, reluctant to invest in them heavily enough to reap real benefit from them.

But there is a core of alert growers, eager to try chemical aids—and one of their current favorites is the pre-emergence herbicide.** A CW check of major producers last week showed that without exception demand is up for the weed killers this spring.

Although exact data is sparse, about 1/10 (on a pound basis) of the current herbicide output is used for pre-emergence application. This means roughly 8.5-9 million lbs. this year. Depending on crop (and area), the percentage of acreage treated runs from virtually nil (in the cases of wheat) to 90% (with asparagus).

Southern Comfort: Corn and cotton are big herbicide users: 2,4-D for corn, several others for cotton. Although percentage use is still fairly small (perhaps 125,000 of the 18 million cotton acres), Southern growers are finding them profit builders.

Top-volume product now for cotton is Chloro-IPC, made by Columbia Southern, division of Pittsburgh Plate Glass Co.; Fairfield Chemicals, division of Food Machinery & Chemical Corp.; and Monsanto. In addition, dinitro compounds† like Dow's Premerg, and Standard Agricultural Chemicals' (Hoboken, N. J.) Sinox PE have been tried, although they aren't used in great volume now.

Du Pont is giving heavy promotion to its urea herbicide, Karmex DL, for cotton application this year, reports fair sales. Some CMU (Karmex W) is used, but it no longer gets the promotion it once did (before DL). Too, use of naphthyl phthalamic acid herbicides, for use in cotton irrigation water, is being probed.

Money Crops: For the most part, commercial gardeners, faced with rising labor costs, turned to the pre-emergence herbicides earliest. As a result, asparagus, melon, bean, and cucurbit (includes cucumbers and members of the gourd family) growers are major users of pre-emergence chemicals like the dinitros, Carbide and Carbon's Crag 1, and Naugatuck Chemicals' Alanap (N-1 naphthyl phthalamic acid).

This year, for the first time to any extent, peanuts are being pre-emergence treated. Carbide's Crag 1, applied (3 lbs./acre) in a narrow band over the rows as the goobers are being planted, has been shown to reduce cultivation cost, and boost yield. Application is still limited—about 50,000 acres this year.

Top Dressing: There are, of course, a number of other pre-emergence weed killers, both on the market and still being researched. Indeed, much of current experimental work is being done on these pregrowth compounds.

Part of the research with these

* Chloro-IPC is isopropyl -N- (3-chlorophenyl) carbamate. CMU, known also as Karmex W, is 3-(*p*-chlorophenyl)-1,1-dimethylurea; related is Karmex DL, 3-(3,4-dichlorophenyl)-1,1-dimethylurea. SES is Crag Herbicide -1, sodium 2,4-dichlorophenoxyethyl sulfate. 2,4-D is 2,4-dichlorophenoxyacetic acid.

** Pre-emergence herbicides are those chemicals applied before the crop breaks through the surface—not necessarily before the weeds emerge.

† Alkanolamine salts of dinitro-o-sec-butylphenol.

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chemicals includes development of application equipment – such machinery has contributed greatly to pre-emergence acceptance.

Pre-emergence types can be used to best advantage only when put down over the crop row at planting time. The advantage is plain—the herbicide eliminates costly hand-weeding of the crops, and often only about a third as much chemical is required as for post-emergence use.

Generally speaking, the pre-emergence herbicides work by providing a plant-toxic top layer of soil—weed seeds, shallowly imbedded, are killed; crop seeds, deeper, are unhurt.

With such mode of action, a very porous soil, and a variety of weather and soil conditions can adversely affect the success of pre-emergence use. But careful growers can handle them, find them a cash-producing adjunct to their agriculture. They're playing a similar role for the chemical makers, and their part is getting fatter.

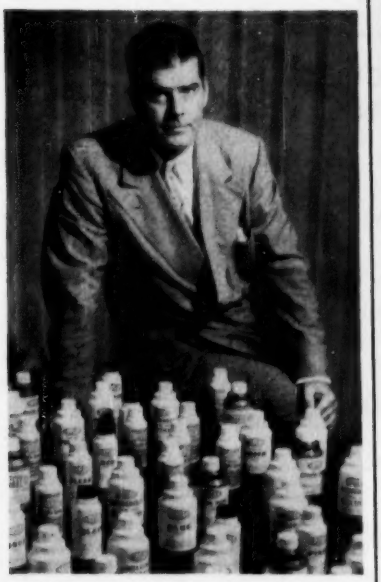
What to Spray

One specialty manufacturer now has its customers doing its application research for it. "Our research department,"—the way Krylon, Inc.'s (Philadelphia) James W. Bampton refers to its consumers—"is constantly finding ways to use our product—and 9 out of 10 of these suggestions point the way to bigger sales."

The users have taken the bit so eagerly in devising applications for Krylon's line of aerosol acrylic sprays and other products that the company will have to move within a couple of months from its 17,000-sq.-ft. plant in Philadelphia to a 43,000-sq.-ft. plant in Norristown, Pa. (John C. Stalfort & Sons, Inc., Baltimore, Md., fills Krylon's aerosols.)

Spray Something: If an object exists, it can, and probably should, be sprayed with something, seems to be the attitude of consumers. Aside from the more homey things, aerosol wielders have sprayed Krylon's acrylics on:

- Viking ships in the Norwegian National Museum (Oslo)—to keep the oak from decaying.
- Helmets of army MPs.
- Holly, mistletoe, Christmas trees.
- Coal (so salesmen can carry lumps as samples and not get dirty).
- And one man, enthusiastically adjusting to the aerosol age, ripped



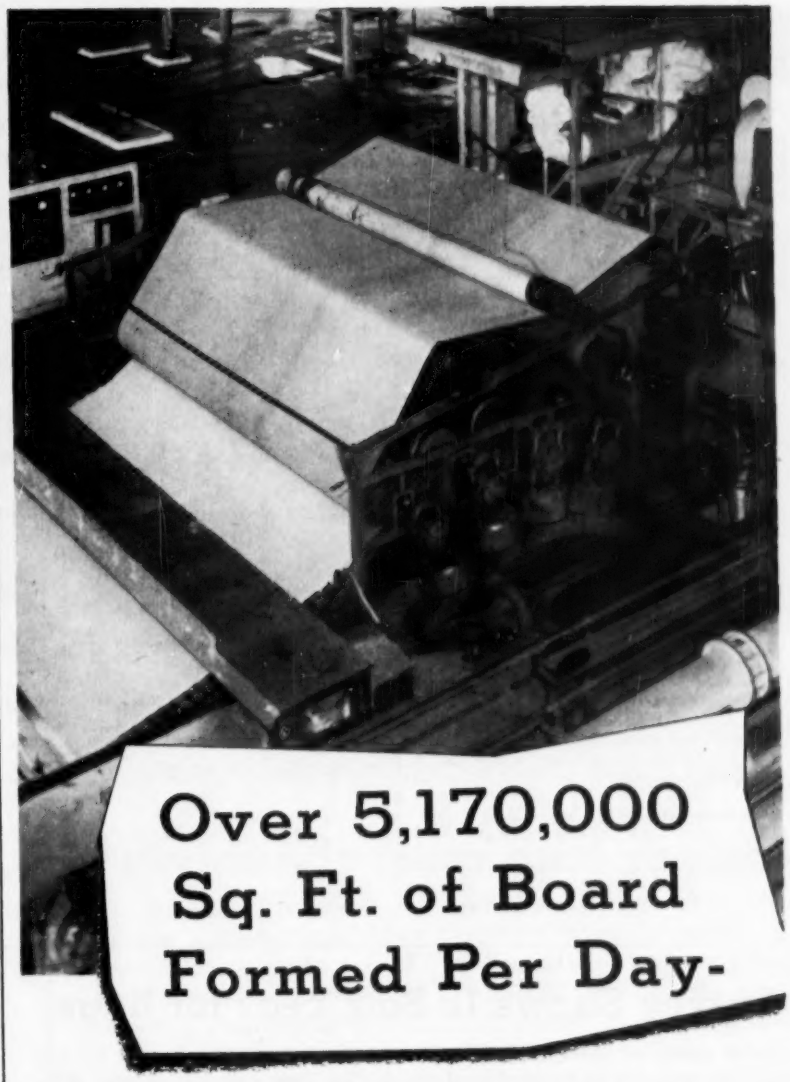
KRYLON'S BAMPTON: He lets users decide.

off his bandage and sprayed a stomach wound. His doctor hastily contacted Krylon, which had to consult a hospital. The wound healed nicely, but the hospital doesn't recommend the treatment.

Out of the Blueprint Stage: Since the users don't seem to need any advice on how to use its sprays, the company is concentrating on distribution and display. Introduced in 1947 as a clear acrylic brush-on (it went aerosol the next year) for blueprints and art work, Krylon is now jobbed to most retail and industrial markets.

Bampton, who came to Krylon in 1953 with considerable merchandising background (Lees Carpet Co., Theodore Presser Co.), immediately began to broaden the operation. The line was increased to 40 items: 15 colors of acrylic, and diverse products like insecticides and a metal-polish kit. Advertising was directed to home, industrial, automotive, radio and electronic markets. The label was revamped to give it display value in grocery and department stores. A 6-oz. can was added to give an under-$1 line.

The Payoff: Krylon sales have quadrupled in the past 18 months, the company reports, and they are expected to continue upward as long as customers stay imaginative. "No one knows how many uses there are for this product," says Bampton, ". . . not a week goes by that consumers don't write and tell us something new."



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	Number of Units				Over One Gallon (data in gallons)
	Less Than Pint	Pint	Quart	Gallon	
Space sprays— with knockdown agents such as pyrethrins and activators, thiocyanates, allethrin, etc., with not more than 2% DDT	1,030,738	8,281,698	3,005,201	384,993	359,419
Residual sprays: With 2½% to 6% DDT with or without other materials except chlordane, dieldrin or lindane	791,356	8,145,559	2,934,644	330,689	76,470
With chlordane, dieldrin or lindane with or without other materials	531,372	10,665,506	3,543,182	145,922	32,924
Fabric-pest sprays— products specifically intended for treating fabrics for moth control, etc.	800	825,058	343,291	21,877	52,805
Livestock sprays— oil-base products to be used without dilution		39,668	49,306	874,465	1,071,434
Livestock emulsion concentrates— to be diluted with water	8,048	75,834	178,473	75,169	50,496
Emulsion concentrates other than livestock—to be diluted with water (non-agricultural)	32,088	96,401	121,357	26,761	220,015
Concentrates— to be diluted with petroleum base (non-agricultural)	548	4,333	17,953	37,897	117,765
Stored grain sprays			392	48,002	291,505
TOTALS	2,394,950	28,134,057	10,193,799	1,945,775	2,272,833

Survey Shows It: Bad Year for Bugs

Third survey of the U.S. insecticide industry was shown at the Chemical Specialties Manufacturers' Assn. gathering last fortnight in Chicago. Participated in by an even larger percentage of firms than the two previous surveys, it reveals several areas with important sales gains in 1954:

- Liquid spray sales reached a new high, after '53's dip below two preceding years. The '54 figure was 10,433,000 gal. (8,161,000 in gallon packages or less, the rest in bulk), a 21% increase over the '53 gallonage (8,614,000).
- Chlordane residual sprays now make up the largest share of the packaged household spray market—35.44% of total sales, slightly greater than the DDT residual sprays—31.51%—and the space sprays. ('53 figures were 33.67%, 29.11%, and 37.22% respectively.)
- Oil-based livestock sprays climbed in output: packaged gallonage totaled 891,750 (it was 683,119 in '53); bulk gallonage jumped 22%, from 875,064 to 1,071,434.
- Wettable livestock powders totaled 2,328,743 lbs. (1,934,813 in 5-lb. packages or larger, 393,930 in smaller units). Dry powders weighing 1,983,692 lbs. were produced (1,183,894 in the 5-lb. or larger packages.) This was a slump (from 3,565,801 lbs.) of 35% from '53 for the wettables; a jump of 21% (from 1,633,744) for the dry material.
- Fabric-pest sprays slumped 23% from '53—263,687 gal. compared with 343,151.

More Cooperation: Not only did the over-all amount of insecticide go up in 1954, but more firms contributed to the survey. Where 52 gave information last year, 70 contributed to the latest survey. (Thus, figures compared above are not strictly comparable.)

The better cooperation showed up particularly in such items as insect repellents and small-pet insecticides. The previous survey, for example, listed sales of only 11,512 less-than-8-oz. units of insect repellent; the figure in the '54 survey is 275,195.

As do the other sections of the CSMA that conduct the surveys, the insecticide division plans to continue its studies.

Traces for Health

Before modern times, table salt was generally made from sea water; it was dried in the sun and you took the salt plus whatever else was there. But nowadays, salt is almost chemically pure. One of the main deletions: magnesium salts, which have a hygroscopic effect, make salt stick together, hard to pour.

Trace Elements Corp. (Houston, Tex.) thinks that purification is a mistake, that a daily intake of other sea-contained elements is important for good health, and that it has the free-flow problem licked. It will soon market

nationally (it is now test-marketing in Houston and Corpus Christi) Admiral Trace Element Sea Salt, which contains, the company says, all presently known mineral elements in essentially the same proportions as they exist in ocean water.

Containing 75% common salt and 25% trace elements, Admiral is made via Dow Chemical Co.'s patented method of extraction. Sand and foreign matter are strained, settled, and filtered out of the ocean water, which is then passed through a submerged combustion chamber. A rotary gas dryer makes the nonhygroscopic salt ready for packaging. Process yields 100 tons trace element salt, 50 tons/month of trace element concentrate.*

Sea-water trace elements—cobalt, fluorine, manganese, iodine, copper, iron, zinc, and molybdenum—are, the company believes, essential for a well-balanced diet; they function as a catalyst or activator in the human metabolism, aiding the activities of vitamins, enzymes, and hormones. Since a small but regular intake of these elements is called for if this be true, the company feels that table salt, which Americans consume at the rate of 5 lbs./person/year, is a logical medium.

•

Hot Foots: Thin-soled summer shoes don't offer much protection against a sizzling summer pavement; hence another specialty market. O-So-Kool (Lexicon Products Inc., Philadelphia) is a stick for cooling the feet, can be rubbed right through the stocking. It contains hexachlorophene, retails at 59¢ and $1.

•

Jack-of-All-Cleaners: Developed to replace a number of special cleaners and abrasives, a new germicidal cleanser is available to janitors. Jade, sold by Griffith Sales Co. (Toledo), is a liquid concentrate that cleans through a solvent action and is safe on all surfaces not affected by water.

•

Neoprene Solvent: Ansul Chemical Co. (Marinette, Wis.) is now selling a polyglycol ether (Ansul Ether 181) for removing neoprene compounds. Suggested applications are on aircraft radomes; to refinish, these previously required scraping. The new ether,

* The concentrate will be used for pharmaceutical capsules (with or without vitamins), additive for animal feeds and for soils.

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applied and allowed to soak in for two hours, gives a readily removable coat. Ansul sells its new material for $1.10/lb. in 450-lb. containers.

•

Paint Trim: Rohm & Haas has whittled 1¢/lb. off the price of its acrylic paint emulsion, Rhoplex AC-33. The cut, third reduction in less than a year, puts the tank-car price (East, Midwest) at 21½¢/lb. for 46% solids materials.

•

Take It Off: Strip Easy, a new formula by S. C. Johnson & Son, Inc., (Racine, Wis.), is designed to remove Heavy Duty Hard-Gloss, a self-polishing maintenance finish. A solution of Johnson's Wax Strip Floor Cleaner, the formula cuts the water-impervious wax.

•

Sun Lotion for Plastics: Ultraviolet-light-caused color change in plastics is said to be prevented by a new chemical, Stabilite, which absorbs ultraviolet. Merix Chemical Co., Chicago, maker of the compound, says it also acts as an antistatic agent to keep the plastic dust-free. The company says it will cost 7/100 of 1¢ to treat 1 sq. ft.

•

Less of a Grind: Lacquer making will require less grinding when Plymouth Zinc Stearate SI-35 is used, says the maker, M. W. Parsons-Plymouth Inc. (New York). Zinc Stearate, which acts as a lubricant when lacquer coats are sanded, usually must be ground in a mill before mixing in; SI-35 can be added directly to the lacquer base.

•

On Retailers' Shelves: Some of the newer specialties offered for household use:

• Rinse-Away is a new paint remover marketed by Bull Dog Corp. (Jersey City, N.J.) for $1.98/qt. Among the touted advantages: after paint has been softened, it can be



Give-and-Take Paving

FLEXIBLE AND RESILIENT, a new type of concrete flooring material—a latex and cement combination—is being introduced by Naugatuck Chemical Co. (division of U. S. Rubber) after six years of development. Called Laticrete, it is claimed to be long-wearing, noise-dampening, and resistant to alkalis and mild acids. More advantages: it's waterproof, nonslip, has good adherence.

The liquid rubber and the powder cement are packaged separately. Mixed in conventional equipment, the compound dries in several hours, cures in two-three days.

wiped away with a damp cloth; remover need not be neutralized before next paint is applied; it is nonflammable.

• Thix is a new gelled-alkyd paint introduced in Canada by Scarfe & Co. Ltd. (Brantford, Ont.). A fast-drying, odorless coating, it is offered in a wide range of colors.

•

Car-Wash Pills: Simoniz Co. (Chicago) will soon have in national distribution a detergent pill for car washing. Sprint Car Wash, packed 12 tablets to a 75¢ tube, is claimed to leave the wax intact on the car. Dropping a pill into a bucket of water makes enough foam for one wash job.

•

Paint Eraser: Wonder Paste is a new paint remover marketed by Wilson-Imperial Co. (Newark, N. J.). A dripless paste, it sells for $1.10/qt.

•

Dry and Breathing: Koppers Co., Inc. (Pittsburgh, Pa.) will become a supplier to the leather industry with a waterproofer that lets the leather breathe. Bavon compound, now being commercially used in Canada under the name Dryon, is a partially neutralized alkenyl succinic acid which leaves the leather's pores open for breathing, but keeps water out, the company says. Bavon can also be utilized in liquid polishes and daubing solutions for consumer use.

•

Carbonate Remover: Westinghouse Electric Corp. has a new carbonate remover, Wes-X 150, which precipitates carbonates in exchange for cyanide ions and assists in the elimination of certain contaminants. It can be used with hydrated lime to control and maintain alkaline cyanide processes. Entire solutions can be batch treated.

CHEMICAL WEEK • ADVERTISER'S INDEX

June 4, 1955

ALUMINUM LTD. SALES, INC. 21
Agency—J. Walter Thompson Co.
AMERICN CAN CO. 52, 53
Agency—Young & Rubicam, Inc.
AMERICAN CYANAMID CO. 22, 23
Agency—Hazard Adv. Co.
AMERICAN MINERAL SPIRITS CO. 42
Agency—Leo Burnett Co., Inc.
AMERICAN POTASH & CHEMICAL CORP. 80
Agency—The McCarty Co.
ANTHONY CO. 68
Agency—The Biddle Co.
AUTOMOTIVE RUBBER CO., INC. 34
Agency—Zelzy & Assoc.
ATLAS POWDER CO. 43
Agency—The Aitken-Kynett Co.
BAKELITE CO., DIV. OF UNION CARBIDE & CARBON CORP. 65
Agency—J. M. Mathes, Inc.
BAKER & ADAMSON PRODUCTS, GENERAL CHEMICAL DIV., ALLIED CHEMICAL & DYE CORP. ..... 3rd Cover
Agency—Atherton & Currier, Inc.
BORDEN CO., THE, MONOMER DEPT. 92
CARBIDE & CARBON CHEMICALS CO., DIV. OF UNION CARBIDE & CARBON CORP. 77, 98
Agency—J. M. Mathes, Inc.
CELANESE CORP. OF AMERICA 33
Agency—Ellington & Co., Inc.
CHEMICAL & INDUSTRIAL CORP. 83
Agency—Strauchen & McKim, Adv.
CHEMICAL MANUFACTURING CO. 76
Agency—G. M. Basford Co.
CHEMICAL SOLVENTS, INC., THE C. P. 72
COMMERCIAL SOLVENTS CORP. 31
Agency—Fuller & Smith & Ross, Inc.
COOPER ALLOY CORP. 69
Agency—Mahool Adv., Inc.
COSDEN PETROLEUM CORP. 67
Agency—Craig & Webster Adv.
DAVENPORT MACHINE & FOUNDRY CO. 72
Agency—Bawden Bros., Inc.
DORR-OLIVER, INC. 99
Agency—Sutherland-Abbott, Adv.
DOW CHEMICAL CO., THE 49
Agency—MacManus, John & Adams, Inc.
DRACCO CORP. 101
Agency—The Jayme Organization
DU PONT DE NEMOURS & CO., INC., E. I., POLYCHEMICALS DEPT. 81
Agency—Batten, Barton, Durstine & Osborn, Inc.
EL DORADO OIL WORKS 26
Agency—Sidney Garfield & Assoc.
ENJAY CO., INC. 39
Agency—McCann-Erickson, Inc.
ETHYL CORP. 15
Agency—H. B. Humphrey, Alley & Richards, Inc.
EVANS RESEARCH & DEVELOPMENT CORP. 80
Agency—Ritter, Sanford & Price, Inc.
FERGUSON CO., THE H. K. 40
Agency—The Bayless-Kerr Co.
FIRESTONE PLASTICS CO. 1
Agency—Grey Adv. Agency, Inc.
FISHER CHEMICAL CO., INC. 62
Agency—G. M. Basford Co.
FOOD MACHINERY & CHEMICAL CORP. CHEMICAL DIV. 36
Agency—James J. McMahon, Inc.
GENERAL AMERICAN TRANSPORTATION CORP., WIGGINS GASHOLDER DIV. 91
Agency—Weiss & Geller, Inc.
GENERAL ELECTRIC CO. 9, 12
Agency—G. M. Basford Co.
GENERAL ELECTRIC CO. 95
Agency—Benton & Bowles Adv.
GIRDLER CO., THE 35
Agency—The Griswold-Eshleman Co.
GLYCERINE PRODUCERS, INC. 65
Agency—G. M. Basford Co.
HALL CO., THE C. P. 32
Agency—Cruttenden & Eger Assoc.
HARCHEM DIV., WALLACE & TIERNAN INC. 78
Agency—Branstater Assoc., Inc.
HERCULES POWDER CO. 93
Agency—Fuller & Smith & Ross, Inc.
HESS TERMINAL CORP. 56
Agency—Mahool Adv. Inc.
HINDE & DAUCH PAPER CO., THE 96
Agency—Howard Swink Adv. Agency, Inc.
INTERNATIONAL NICKEL CO., INC. THE 88
Agency—Marschalk & Pratt Co., Inc.
JEFFERSON CHEMICAL CO. 84
Agency—Hazard Adv. Co.
KAISER ENGINEERS 61
Agency—Harrington-Richards, Adv.
KETONA CHEMICAL CO. 27
Agency—Sparrow Adv. Agency
LINDE AIR PRODUCTS CO., DIV. UNION CARBIDE & CARBON CORP. 94, 95
Agency—J. M. Mathes, Inc.
LITHIUM CORP. OF AMERICA, INC. 6
Agency—Keystone Adv., Inc.
LUCIDOL DIV., WALLACE & TIERNAN INC. 82
Agency—Landsheft & Barber, Inc.
MATHESON CO., THE 98
Agency—Firestone Adv. Agency
METALSALTS CORP. 68
Agency—Charles W. Curts, Adv.
NATIONAL ANILINE DIV., ALLIED CHEMICAL & DYE CORP. 73
Agency—James J. McMahon, Inc.
NATIONAL CARBIDE CO., DIV. OF AIR REDUCTION CO. 41
Agency—Fuller & Smith & Ross, Inc.
NATIONAL LEAD CO., THE 45
Agency—Marschalk & Pratt Co. Inc.
NITROGEN DIV., ALLIED CHEMICAL & DYE CORP. 71
Agency—Atherton & Currier, Inc.
OLIN MATHIESON CHEMICAL CORP. ..... 2nd Cover
Agency—Doyle, Kitchen & McCormack, Inc.
PACIFIC COAST BORAX CO. 87
Agency—Howard M. Irwin & Assoc.
PENNSYLVANIA INDUSTRIAL CHEMICAL CORP. 89
Agency—Walker & Downing Adv.
REFINED PRODUCTS CORP. 16
Agency—James Civille Adv.
REILLY TAR & CHEMICAL CORP. 29
Agency—The House of J. Hayden Twiss
RHODIA, INC. 5
Agency—The House of J. Hayden Twiss
ROHM & HAAS CO. 75
Agency—Arndt, Preston, Chapin, Lamb & Keene, Inc.
SHIPPERS' CAR LINE CORP. 79
Agency—French & Preston, Inc.
SOLVENTS & CHEMICAL GROUP 2
Agency—Weiss Geller, Inc.
STALEY MFG. CO., A. E. 50
Agency—Ruthrauff & Ryan, Inc.
STEEL SHIPPING CONTAINER INSTITUTE, INC. 66
Agency—G. M. Basford Co.
STEPAN CHEMICAL CO. 51
Agency—Frank C. Nahser, Inc.
TRAVELETTER, INC. 25
Agency—Moore & Co., Inc.,
ULTRA CHEMICAL WORKS, INC. 76
Agency—S. R. Leon Co., Inc.
UNION CARBIDE & CARBON CORP., CARBIDE & CARBON CHEMICALS CO. 77, 98
Agency—J. M. Mathes, Inc.
VIRGINIA-CAROLINIA CHEMICAL CORP. 47
Agency—Albert Sidney Noble Adv.
WEST END CHEMICAL CO. 87
Agency—Norton M. Jacobs Co.
WITCO CHEMICAL CO. ..... 4th Cover
Agency—Hazard Adv. Co.
WYANDOTTE CHEMICALS CORP. 57
Agency—Brooke, Smith, French & Dorrance, Inc.

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Classified Advertising
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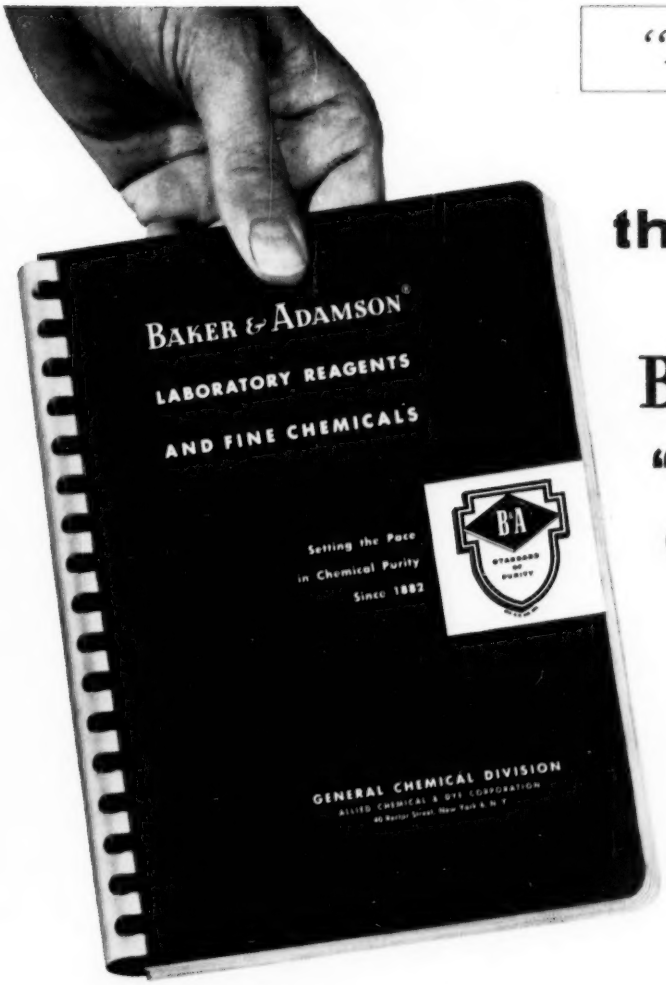
CHEMICALS: Offered/Wanted 102
EMPLOYMENT 102
EQUIPMENT: Used/Surplus New For Sale 103
Wanted 103
MANAGEMENT SERVICES 102
Special Services 103

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